

## About the College Board

The College Board is a mission-driven not-for-profit organization that connects students to college success and opportunity. Founded in 1900, the College Board was created to expand access to higher education. Today, the membership association is made up of more than 5,900 of the world's leading educational institutions and is dedicated to promoting excellence and equity in education. Each year, the College Board helps more than seven million students prepare for a successful transition to college through programs and services in college readiness and college success — including the SAT® and the Advanced Placement Program®. The organization also serves the education community through research and advocacy on behalf of students, educators and schools.

For further information, visit [www.collegeboard.org](http://www.collegeboard.org).

## About MPR Associates, Inc.

MPR Associates, Inc., is a research and consulting firm specializing in education. We are committed to improving education policy and practice and increasing access to and success in education and work for youth and adults. MPR provides clear, unbiased, policy-relevant research and innovative data tools for educators, policymakers, and the public. Our work focuses on K–12 school improvement; college and career preparation; postsecondary education, with an emphasis on community college success; and adult education.

For further information, visit [www.mprinc.com](http://www.mprinc.com).

# Contents

v	List of Figures	17	<b>Developmental Education Placement</b>
vii	Preface	18	Measures Reported by State
viii	The Advisory Panel	19	What the Research Tells Us
ix	Executive Summary	20	Placement in Developmental Courses
xii	The Completion Arch Core Measures and Summary of Data Availability	22	Participation in Developmental Courses
<b>1</b>	<b>Introduction</b>	<b>25</b>	<b>Progress</b>
2	Why <i>The Completion Arch</i> ?	26	Measures Reported by State
3	Who Will Use <i>The Completion Arch</i> ?	29	What the Research Tells Us
4	<i>The Completion Arch</i> Framework	31	Completion of Developmental Education Courses and Sequences
7	Availability of Measures Across the United States	32	Enrollment in and Completion of Gatekeeper Courses
8	<i>The Completion Arch</i> Website Overview	33	Threshold Number of Credits in Specified Time and Completion of Transfer Preparatory Courses
<b>9</b>	<b>Enrollment</b>	34	Persistence
10	Measures Reported by State	35	Full-Time Attendance in First Term
11	What the Research Tells Us	36	Completion of Courses Attempted
13	Fall Enrollment	37	Continuous Enrollment
15	Unduplicated Annual Enrollment	38	Credits in First Year
16	Future Updates	39	Summer Credits Earned
		40	Future Updates

## Contents — continued

### **41 Transfer and Completion**

- 42 Measures Reported by State
- 44 What the Research Tells Us
- 45 Graduation Rates, Time to Degree and Completion Rates Within Six Years
- 47 Number of Degrees and Certificates Awarded
- 48 Credits to Degree
- 49 Persistence Without a Degree After Six Years and Near Program Completion After Six Years
- 50 Future Updates

### **51 Workforce Preparation and Employment Outcomes**

- 52 Measures Reported by State
- 53 What the Research Tells Us
- 54 Licensure Exam Pass Rates
- 55 Job Placement Rates
- 57 Graduates' Wages and Wage Growth
- 58 Future Updates

### **59 Conclusions and Next Steps**

- 60 References
- 67 Appendix A. Primary Data Sources
- 71 Appendix B. Availability of Indicators by State
- 73 Appendix C. Glossary

## List of Figures

Figure 1. Number of Students Enrolled in U.S. Community Colleges, Fall Term: 1963–2009	11	Figure 14. Number of Enrollment Spells After Six Years, U.S. Community College Students	37
Figure 2. Percentage of Undergraduates in Community Colleges by State: Fall 2010	13	Figure 15. One-Year Credit Milestones, U.S. Community College Students	38
Figure 3. Percentage of Students Enrolled in Community Colleges: Fall 2010	14	Figure 16. Percentage of Students Completing Within Six Years, North Carolina Community Colleges	45
Figure 4. Percentage Distribution of Community College Students by Demographic Characteristics: Fall 2010	14	Figure 17. Six-Year Completion Rates for U.S. Community College Students	46
Figure 5. Percentage Distribution of Community College Students by Enrollment Characteristics: Fall 2010	14	Figure 18. Number of Certificates and Associate Degrees Awarded in 2009-10 by U.S. Community Colleges	47
Figure 6. Unduplicated Annual Enrollment: 2009-10	15	Figure 19. Average Number of Credits Earned Toward a Degree by Full-Time Students Who Earned Associate Degrees for 27 CCA States	48
Figure 7. Percentage of First-Time Degree-Seeking Students Enrolled in ATD Colleges in Fall 2003 to Fall 2004 Who Were Referred to Different Levels of Developmental Reading and Mathematics, by Levels Offered	21	Figure 20. Persistence Without a Degree After Six Years for U.S. Community College Students	49
Figure 8. Participation in Developmental Math, Reading and Writing in California	22	Figure 21. Pass Rates for Texas Community and Technical College Students Who Took Licensure and Certification Exams in 2007-08, by Occupational Field	54
Figure 9. Percentage of Community College Students Enrolled in Developmental Math and English Courses During Their First Academic Year for 27 CCA States	23	Figure 22. Percentage of Spring 2007 Virginia Community College Exiters Employed in Spring 2007, Six Months Later and Two Years Later	55
Figure 10. Completion of Developmental Education Requirements in ATD Colleges	31	Figure 23. Employment and Workforce Participation Rates for Students First Enrolled in U.S. Community Colleges in 2003-04	56
Figure 11. Completion of Gatekeeper Math Courses	32	Figure 24. Average Salary for Oklahoma State System Graduates After One Year and Five Years, by Type of Award	57
Figure 12. Among California Community College Transfer Students, Percentage Who Completed a Transfer Curriculum Prior to Transferring	33	Figure 25. Median Salary in 2009 for Students Who First Enrolled in U.S. Community Colleges in 2003-04	58
Figure 13. Completion of At Least 80 Percent of Course Credits Attempted in First Year, North Carolina Community College Students	36		



## Preface

People really have to understand the metrics and the data behind the metrics. ... There's a much larger story when we think about community college students and what their intent is and why they come here.

Richard Rhodes, president, Austin Community College<sup>1</sup>

This statement perfectly captures the reason MPR Associates and the College Board undertook the creation of *The Completion Arch: Measuring Community College Student Success*. The above quote is part of Richard Rhodes's response to the Texas Association of Business, which posted the Austin Community College three-year graduation rates on a public billboard to publicize what the association perceived as the college's failure to graduate enough students. But as Rhodes notes, there is a broader story beyond graduation rates.

What is that story? What metrics convey the complex narrative not only of the multiple missions of community colleges, but also the academic success of the students who attend these institutions and account for more than 40 percent of all undergraduates enrolled in higher education? *The Completion*

*Arch* aims to shed light on the story by synthesizing publicly available national, state- and initiative-level data that are presented in indicators of student progress and success. These indicators are summarized in this report and reported in detail on the new *Completion Arch* website. The purpose of *The Completion Arch* is not to advocate for any one point of view, but to let the data tell the story.

We began by identifying a common set of metrics designated by prominent initiatives, organizations and researchers as being linked to community college student success. We organized the metrics into a five-part framework spanning the community college experience from first enrollment to entry into the workforce after college. Between the events of enrollment and employment are indicators that summarize students' advancement through their education programs. Indicators report on the extent to which students participate in developmental education, the progress they make from year to year, and how likely they are to reach credit milestones or complete gatekeeper

courses. Some indicators characterize momentum points — behaviors associated with successful outcomes, such as attending full time and completing courses attempted. And, of course, we report outcomes not only in the traditional terms of transfer and degree completion, but also in terms of productivity, such as the time it takes students to complete a credential and the number of awards that colleges confer.

One of the most important functions of *The Completion Arch* is to explain the data underlying each indicator, to describe exactly what is measured, to delineate who is counted and to explain why the indicator is important. Users of this resource will learn, for example, the difference between an institution-reported graduation rate and a student-level longitudinal completion rate. The state indicators come from published sources, while the national indicators come from survey data collected by the U.S. Department of Education. In some areas, data are scarce and the related indicators are limited in what they can tell us, but we have endeavored to report what data are available. As more data become available, we will be able to present a fuller account of how community college education prepares students for a career or for education beyond a community college degree.

<sup>1</sup> Hamilton, R. (2011, December 9). Graduation-rates campaign heads to Dallas. *The Texas Tribune*. Retrieved Dec. 15, 2011, from <http://www.texastribune.org/texas-education/higher-education/graduation-rates-campaign-heads-dallas/>

## The Advisory Panel

In developing *The Completion Arch*, the College Board and MPR Associates have taken the long view. Our aim is to build a comprehensive resource that serves a broad audience and facilitates communication among the many initiatives and organizations working to increase student success. The initial launch marks the first step in this endeavor. We will update the website and the print report on a regular basis to incorporate newly released data and to add new metrics as they become available. In doing so, we strive to present the most up-to-date information to colleges, policymakers, philanthropic organizations and other constituents to assist them in making evidence-based decisions about how to advance the success of community college students.

### **Laura Horn**

Director, Postsecondary Education and Transition to College  
MPR Associates, Inc.  
Berkeley, CA

### **Christen Pollock**

Vice President, Advocacy & Policy Center  
The College Board  
New York, NY

This initiative is guided by the education leaders below, whose commitment to community colleges and the students they serve are well known and highly regarded. Their advice and counsel have been instrumental in creating a resource of value for educators, policymakers, researchers and students.

### **Mike Baumgartner**

Vice President  
Complete College America (CCA)  
Washington, DC

### **Michelle Cooper**

President  
Institute for Higher Education Policy  
Washington, DC

### **Kevin Dougherty**

Associate Professor of Higher Education  
Community College Research Center (CCRC)  
Teachers College, Columbia University  
New York, NY

### **Kenneth L. Ender**

President  
Harper College  
Palatine, IL

### **Stephen J. Handel**

Executive Director, The College Board  
Co-chair, Completion Arch Advisory Panel  
San Jose, CA

### **Richard Kazis**

Senior Vice President  
Jobs for the Future  
Boston, MA

### **Paul Lingenfelter**

President  
State Higher Education Executive Officers (SHEEO)  
Boulder, CO

### **Byron McClenney**

Achieving the Dream (ATD)  
Project Director, Community College Leadership Program  
The University of Texas at Austin  
Austin, TX

### **Patrick Perry**

Vice Chancellor  
California Community Colleges Chancellor's Office  
Sacramento, CA

### **Jay Pfeiffer**

Former Deputy Commissioner  
Florida Department of Education  
Tallahassee, FL

### **Kent Phillippe**

Associate Vice President  
Voluntary Framework of Accountability (VFA)  
American Association of Community Colleges (AACC)  
Washington, DC

### **Paul Sechrist**

President  
Oklahoma City Community College, OK  
Chair, Board of Trustees, The College Board  
Oklahoma City, OK

### **Steve Titan**

Treasurer and Vice President  
The College Board  
New York, NY

### **Ronald Williams**

Vice President, The College Board  
Co-chair, Completion Arch Advisory Panel  
New York, NY



## Executive Summary

It is widely acknowledged that more Americans need to acquire postsecondary degrees for the United States to remain competitive in the global economy. The Obama administration and several influential philanthropic, nonprofit and state-led organizations, including the College Board, have set ambitious goals to increase the share of young adults who hold postsecondary credentials. Taken together, these goals translate to increasing by at least 50 percent the proportion of 18- to 26-year-olds who hold “high-quality” postsecondary credentials (by 2020 or by 2025, depending on the organization). These goals cannot be met without the sustained and significant participation of community colleges, which enroll more than 40 percent of U.S. undergraduates.

Essential to tracking student success at community colleges is the availability of solid data and commonly defined metrics that go beyond measuring the traditional (and limited) enrollment and graduation rates that these colleges report to the federal government. In particular, what is needed are metrics that illuminate what happens to students between the starting and the ending points: Where do they make progress? Where do they falter? Do

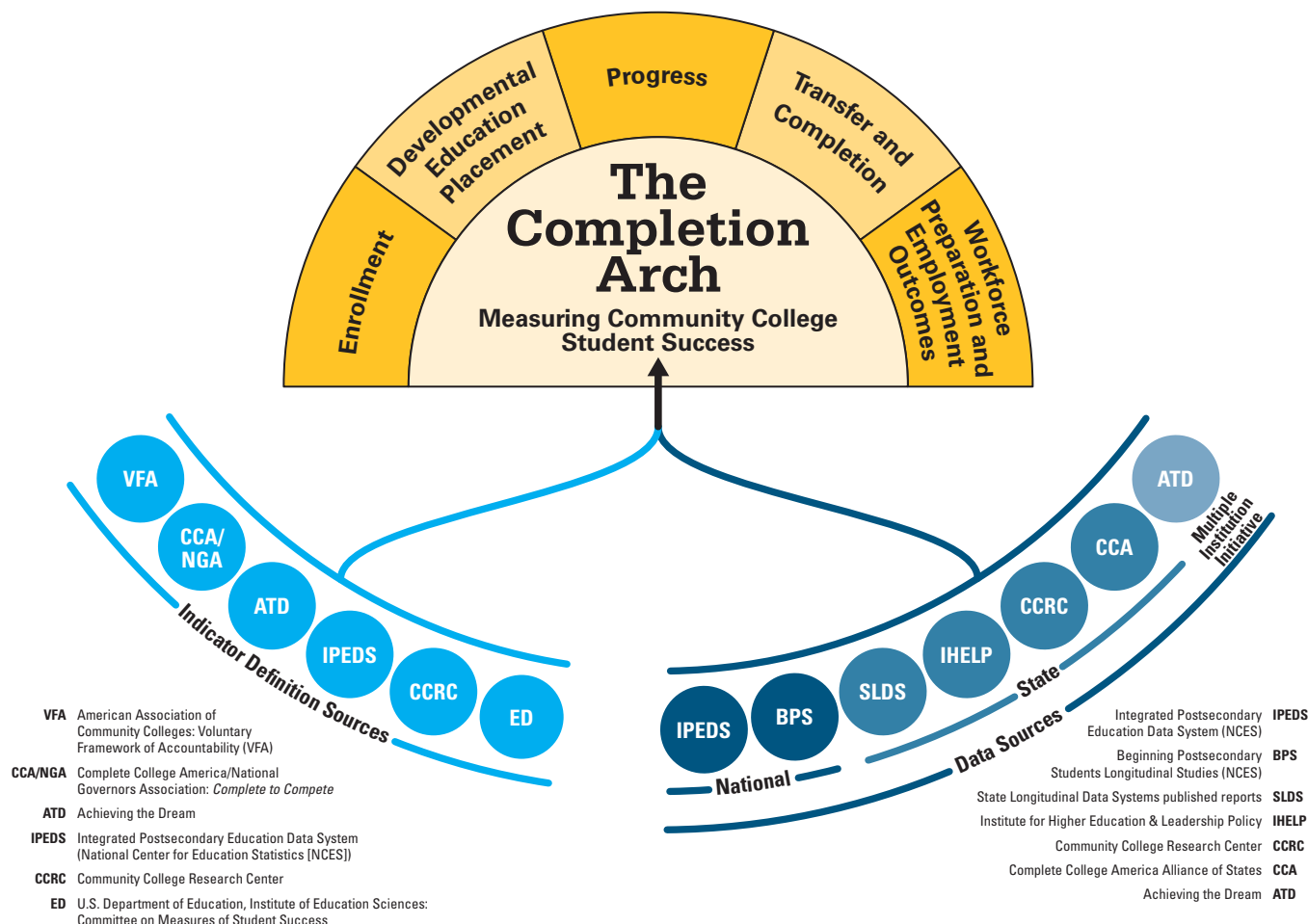
they achieve interim milestones? These types of metrics can help community colleges and states more quickly evaluate whether specific programs and policies are leading to successful interim outcomes and also to determine where interventions may be necessary to aid students who lose momentum or show signs of failure.

Prominent initiatives, researchers and associations have made it their prerogative to define and report such metrics as well as to redefine completion to include more types of students who attend community colleges — part-time students; those who first enroll in winter, spring and summer; and students who do not start in a certificate or degree program. Some of the key organizations leading the data reform effort include Achieving the Dream (ATD), Complete College America (CCA), Community College Research Center (CCRC) and Voluntary Framework of Accountability (VFA). While the missions of these groups differ, ranging from data-driven program improvement (ATD), to college accountability (VFA and the U.S. Department of Education), to state policy reform (CCA), they have much in common in terms of the metrics they have defined and, in some cases, the data they collect and report.

*The Completion Arch* was conceived to consolidate the efforts of these initiatives by compiling a set of common metrics and summarizing the statistics in the form of national-, state- and initiative-level indicators of student progress and success. These metrics and summary statistics are presented in a newly developed website (<http://completionarch.collegeboard.org>) that allows researchers, educators, policymakers and others to access the full range of publicly available data addressing community college student progress and success. *The Completion Arch* also provides in-depth information concerning important parameters of each metric (e.g., What is measured? Who is counted? What are the advantages and the limitations of the data?). In presenting the broad range of metrics associated with student success in community colleges, *The Completion Arch* will aid state and national initiatives in their efforts to increase student completion rates and highlight the multiple missions of community colleges.

As illustrated in the figure on the next page, we organized *The Completion Arch* metrics into a five-part framework spanning the community college experience from first enrollment to entry into the workforce after college.

## Framework



Between these beginning and end points are indicators that summarize students' advancement through their education programs, including "Developmental Education Placement," "Progress," and "Transfer and Completion." The figure also displays the sources for metric definitions and the primary data sources.

Each of the five areas encompasses multiple measures. A *measure* is a conceptual definition of student progress within the general topical area. For example, as shown in the table on page xii, Enrollment consists of two measures: fall enrollment and unduplicated annual enrollment. Progress, however, is a much larger area, including pre-

college and college milestones and indicators signaling momentum.

Each measure further consists of one or more *indicators* reported at the national, state and initiative levels. An indicator is a specific operational definition of a measure and its results. Each indicator may have a slightly different outcome, population or time frame. The details — which include what precisely is being measured, which students are being counted and for what time period — are reported with the indicator. One of the most important functions of *The Completion Arch* is to explain the data underlying each indicator so that users of this resource will understand how indicators differ.

Within each area, we also identify indicators for future additions to *The Completion Arch*. Some indicators have data available (e.g., simultaneous enrollment in more than one institution listed under "Transfer and Completion"), others do not, but data are anticipated in the future (e.g., student learning outcomes listed under "College Milestones").

*The Completion Arch* presents more than 150 unique indicators of student progress and success, and hundreds of national and state variations. Many are summarized in this report and all are shown in detail on the website. Ideally, each indicator would be reported by

every state in a comparable manner. In practice, however, with the exception of Integrated Postsecondary Educational Data System (IPEDS) and CCA indicators, many are reported by only a few states, and they differ in meaningful ways. In some cases, data are scarce and the indicators are limited in what they can tell us, but we hope the information they convey leads to better-defined metrics in the future. Whenever possible, results are broken out by important student characteristics such as gender, race/ethnicity, socioeconomic status (income and parents' education), full-time or part-time enrollment, age, and fields of study.

In addition to presenting data regarding community college student success in a comprehensive but easy-to-use format, *The Completion Arch* will regularly highlight important empirical trends gleaned from the contributions of initiatives participating in this project. In this inaugural report, we highlight such trends from indicators in each of the five areas:

- **Enrollment:** Nearly 11 million students were enrolled in community colleges nationwide in 2009-10 over the fall, winter, spring and summer terms; this number is 53 percent higher than the enrollment for fall 2009 alone, reflecting the large share of community college students who enroll in terms other than fall.
- **Developmental Education Placement:** Three-fifths of students attending ATD colleges (more than two million first-time students at 160 colleges) were referred to developmental math, 30 percent to courses two levels below college math and 17 percent to courses one level below college math.
- **Progress (College Milestones):** Some 44 percent of community college students nationwide completed a gatekeeper math course within six years. Younger students (age 18 or younger at first enrollment) were more successful in doing so than their older counterparts age 24 or older.
- **Progress (Momentum):** More than half (54 percent) of North Carolina community college students who enrolled for the first time in 2004 completed at least 80 percent of their course credits attempted in their first year.
- **Transfer and Completion:** About one-third of community college students nationwide attained a degree or certificate within six years (between 2004 and 2009). When students who transferred to a four-year college but did not attain a credential during this period (11 percent) are counted as completers, the six-year completion rate rises to 46 percent.
- **Workforce Preparation and Employment Outcomes:** The average salary for Oklahoma State System graduates in 2005-06 who earned an Associate in Applied Science degree (A.A.S.) was higher than that of their peers who earned a bachelor's degree (B.A./B.S.) one year after graduation.

# The Completion Arch Core Measures and Summary of Data Availability

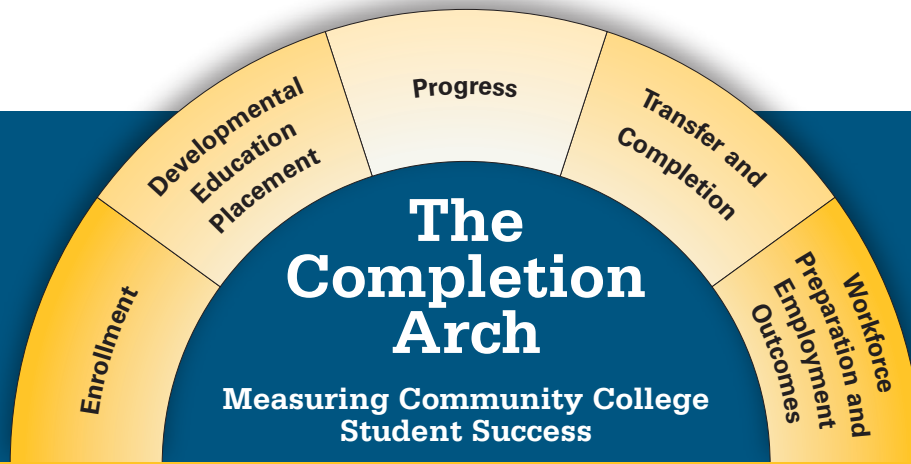
Measure title	National		State		Multiple institutions ATD colleges <sup>1</sup>
	Student characteristics	Number of states	By student characteristics	States	
Enrollment					
Fall enrollment	●	50	●		—
Unduplicated annual enrollment	●	50	●		—
Transition to community college [future addition]					
Transition of adults to community college [future addition]					
Developmental Education Placement					
Placement in developmental courses	—	1	—	VA	●
Participation in developmental courses	T	28	O	CA, CCA states*	—
Progress					
Precollege					
Milestones	—	2	—	CA, VA	—
Completion of developmental sequence	—	25	O	CCA states	●
Completion of General Educational Development (GED) test or equivalent [future addition]					
College	—	1	—	VA	●
Milestones	T	24	O	CA, CCA states	●
Completion of gatekeeper courses	T	3	●	CA, NC, WA	—
Threshold number of credits in specified time	●	50	●		—
Persistence over terms and years	—	1	●	CA	—
Completion of transfer curriculum	—				—
Student learning outcomes (in development)					
Momentum	●	50	—	CA, NC, VA	●
Points	T	3	O	CA, NC, VA, WA	—
Completion of courses attempted	T	4	O	CA, NC, VA, WA	—
Specified credits earned within one year	T	1	—	CA	●
Continuous enrollment	T				—
Summer credits earned	T	1	—	CA	—
Early warning signs of dropout [future addition]					
Transfer and Completion					
Graduation rates	●	50	●		—
Number of degrees and certificates awarded	●	50	●		●
Completion rates within six years	T	10	●	CA, CT, FL, NC, OH, TN, TX, VA, WA, WI	—
Persistence without a degree after six years	T	7	O	CA, CT, FL, NC, OH, TX, VA	—
Time to degree	T	28	●	IA, CCA states	—
Credits to degree	—	27	●	CCA states	—
Near program completion after six years	—	—	—		●
Simultaneous enrollment at more than one institution [future addition]					
Transfer without completing transfer-level curriculum [future addition]					
Completion of other student goals [future addition]					
Workforce Preparation and Employment Outcomes					
Licensure exam pass rates	—	5	O	MA (only RN exam), NC, OH, TX, WY	—
Job placement rates	T	12	O	CT, FL, IL, KY, OH, OR, TN, TX, VA, WA, WI, WY	—
Graduates' wages and wage growth	T	10	O	CT, FL, IA, IL, KY, OK, OR, VA, WA, WI	—

● Available. O Partial availability. — Not available or in development. T Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09) Postsecondary Education Transcript Study (PETS:09).  
\*Complete College America (CCA) alliance includes data from these states: AR, AZ, CO, FL, GA, HI, ID, IL, IN, KY, LA, MA, MD, MO, MS, NC, NM, NV, OH, OK, OR, SD, TN, TX, UT, VA, WA, WV, and WY.

● Available. O Partial availability. — Not available or in development. T Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09) Postsecondary Education Transcript Study (PETS:09).

\*Complete College America (CCA) alliance includes data from these states: AR, AZ, CO, FL, GA, HI, ID, IL, IN, KY, LA, MA, MD, MO, MS, NC, NM, NV, OH, OK, OR, SD, TN, TX, UT, VA, WA, WV, and WY.

<sup>1</sup> Achieving the Dream (ATD) colleges.



## Introduction

It is widely acknowledged that more Americans need postsecondary credentials for our country to remain competitive in the global economy. In 2009, President Obama set an ambitious goal for the United States to have the largest share of adults with postsecondary credentials among all nations in the world by 2020. Currently, 39 percent of our population holds such credentials, and the College Board aims to raise that figure to 55 percent by 2025. Furthermore, the goal of the Bill & Melinda Gates Foundation is to double the percentage of low-income and minority young adults attaining a postsecondary credential by age 26. Following suit in April 2010, six prominent community college organizations signed a Call to Action — a pledge to increase by 50 percent the number of students with high-quality degrees and certificates by 2020. To achieve these goals, improving student success at community colleges is imperative because these institutions enroll at least 40 percent of all undergraduates (Staklis, 2010).

To track our progress toward meeting these ambitious goals, we need accurate and reliable data. Historically, however, the only community college completion measures systematically collected on a national level have been graduation rates that institutions are mandated to report to the Integrated Postsecondary Educational Data System (IPEDS) at the National Center for Education Statistics (NCES). These data have several limitations, however, especially in describing the academic progress of community college students (discussed in detail on pages 44–45).

Beyond accountability, however, lies the formidable challenge of actually improving students' rates of community college completion. Identifying factors that contribute to student success is essential to this effort. To this end, numerous foundation- and state-led initiatives have established frameworks for assessing the progress of community college students. Although the terminology of the proposed measures may differ, many of them are conceptually similar. For example, most recognize the need to measure such critical milestones as credit thresholds and successful completion

## Why *The Completion Arch*?

of the first college-level course (Moore & Shulock, 2009; Adelman, 2005; Calcagno, Crosta, Bailey, & Jenkins, 2006; Chen, 2005; Cabrera, Burkum, & La Nasa, 2005). Further, they seek to quantify students' attainment of "momentum points," key student behaviors that precede milestones and signal the probability of achieving them, such as the completion of a threshold number of credits in a specified time. Tracking milestones and momentum points helps colleges identify obstacles or "gatekeeper" courses that may prevent many students from progressing along the community college path. By more clearly understanding where students falter, community colleges can strategically focus their scarce resources to help improve the success of their students and increase their completion rates.

Policymakers at all levels of government rely on data to inform policy and practice. Officials also need detailed, accurate statistics to assess the extent to which community colleges educate students and prepare them for employment and transfer to four-year institutions.

The indicators in *The Completion Arch* help fill the need for useful, reliable and centrally organized statistics on the academic progress of community college students. The indicators present pub-

licly available and commonly defined metrics of the progress and success of community college students from the time they first enroll until they enter the workforce after college. In synthesizing hundreds of indicators from 50 states and dozens of sources — and collecting these data in a single place — *The Completion Arch* aims to be a comprehensive resource for a wide audience of college officials, state policymakers, researchers and philanthropic organizations as these groups strive to improve community college education.

## Who Will Use *The Completion Arch*?

*The Completion Arch* will serve a broad audience. First and foremost are the community colleges themselves. Staff at the campus, district and system levels might use *The Completion Arch* to improve their own data collection efforts so they can better evaluate programs and policies.

Academic researchers can use these indicators in much the same way, but they usually use them for the evaluation of state or national policies and often with an emphasis on broader empirical issues such as identifying factors that affect access, equity, efficacy and efficiency.

Foundations need reliable indicators to target their grants to specific regions,

populations and educational components of community colleges that further their philanthropic goals. The data may assist these organizations in evaluating the value of community college interventions.

Accrediting agencies may draw on the broad perspective and national scope of the indicators in *The Completion Arch* to give context to the experiences of students at the community colleges they evaluate and to shape appropriate benchmarks of student progress and success.

Other educators and policymakers may benefit from access to these indicators, especially where published national and state statistics do not exist or are not

available specifically for community colleges. For those outside the realm of community college policy and practice, clear and meaningful indicators of student progress offer a window into the multifaceted world of community college education.

Finally, journalists need relevant and current data to add context to their coverage of community college issues and to provide a backdrop for their stories. Even prospective and current community college students and their parents, although not intended to be a primary audience for *The Completion Arch*, can use these indicators to set their expectations and plans to best meet their educational and career goals.



## The Completion Arch Framework

The *Completion Arch* groups indicators into five topical *areas* representing the progression of students into and through community college and eventually into the workplace after college (as illustrated in the figure on the next page). The five areas are as follows:

- Enrollment
- Developmental Education Placement
- Progress
- Transfer and Completion
- Workforce Preparation and Employment Outcomes

Each area encompasses multiple measures. As used here, a *measure* is a conceptual definition of student progress within the general topical area. For example, Enrollment consists of two measures: fall enrollment and unduplicated annual enrollment. The area of Progress includes 11 measures, ranging from completion of the first developmental course to earning college credits during the summer term.

Each measure further consists of one or more *indicators*. An indicator is a specific operational definition of a measure and its results. For example, one of the measures in the Progress area is “specified number of credits earned in the first year.” The related indicators are the actual numbers of credits within a year, which vary by state (e.g.,

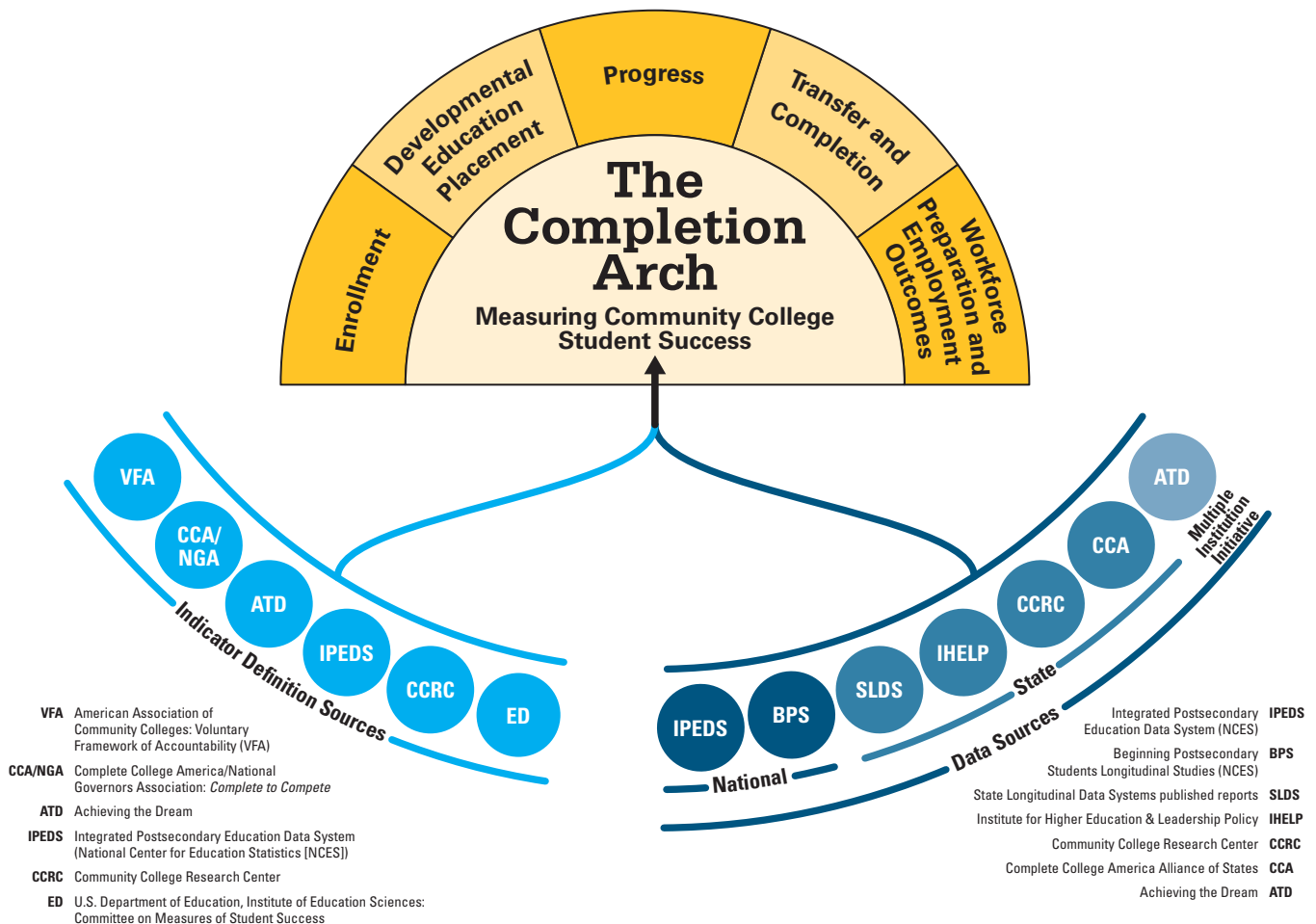
Washington reports 30 credits within one year, while Virginia reports 24 or more credits within a year). The indicator’s details, including what precisely is being measured, which students are being counted and for what time period, are usually determined by the source of the indicator, and each indicator describes those parameters. Some indicators are more useful depictions of student success than others, even when they correspond to the same measure. Considerations that make some indicators more valuable than others include the following:

- How recent is it? Indicators from many years ago may less accurately reflect the students of today and tomorrow.
- How actionable is it? That is, does the indicator describe something that can be changed by community college officials or other policymakers?
- How inclusive is it? For example, indicators based on first-time, full-time students exclude the majority of community college students (Offenstein & Shulock, 2009), and indicators of average time to degree or credits to degree exclude students who do not complete degrees within the time period they are tracked.

- How comprehensive is the coverage? Measures of employment status and salaries derived from state employment records often miss students who work in other states, work for the federal government or are self-employed, but some states use supplementary data to help fill these gaps.
- Is it reported periodically, or was it an ad hoc report? Periodic data collections, such as the annual IPEDS data collections, enable tracking trends over time.
- Can it be compared across states? How many states? Interstate comparisons add valuable context and meaning, but currently only indicators from IPEDS are comparable for all 50 states and indicators from Complete College America are comparable for up to 27 states.
- Are its data available at the national level? Currently, only IPEDS and the Beginning Postsecondary Students (BPS) Longitudinal Study data are available for the national group of community college students. (The Achieving the Dream initiative includes community colleges from across the United States, but the data are not representative of colleges or students nationally.)



## Framework



- Is it valid and reliable over time?  
For example, some indicators are restricted to self-identified degree-seeking students, but most community college students change their degree goals over time (calculated from Bailey, Jenkins, & Leinbach, 2005, figure 8) and may claim to be degree-seeking solely to qualify for financial aid (Offenstein & Shulock, 2009).
- Does it track students after they transfer? Most indicators do not, even though nearly half of community college students attend more than one institution (Peter & Cataldi, 2005, table 2), but BPS and a few states do

track outcomes for students across postsecondary institutions.

- To what degree is it disaggregated by subgroup?

On this last point, whenever possible, results are broken out by important student characteristics such as gender, race/ethnicity, socioeconomic status (income and parents' education), full-time or part-time enrollment, age, and fields of study. Indicators of enrollment in developmental education and enrollment in and completion of gatekeeper courses are often disaggregated by students' initial placement or the extent to which they enroll in developmental courses. Disaggregation is important

for measuring equity across different groups of students. If an indicator shows a particular group of students to be much less successful, it might justify a policy change. In a few cases, group differences might be perfectly understandable, such as part-time students taking longer to accumulate credits and to graduate than full-time students. Likewise, older students might be less successful in some aspects of progress and completion than younger students because the former group is more likely to have competing work and family responsibilities, but they might be more successful in the workplace after college because they have more employment experience on average.

In some areas, there are measures related to student success for which no data are currently available. Although basic accountability measures such as enrollment and number of awards are widely reported at both the national and state levels, many interim progress measures, such as student learning outcomes, are still being developed. This report explains what these forthcoming measures are and why they are important. The website will be designed to accommodate regular updating as new metrics are defined and more current data become available.

## What is a “degree-seeking” student?

Many indicators in *The Completion Arch* are limited to “degree-seeking” students — those who plan to earn a certificate or degree (which may include a bachelor’s degree after transferring to a four-year institution) and are not enrolled solely for recreation, personal interest, developing job skills, or some other reason. The rationale for restricting the indicators to degree-seeking students, in addition to making the indicators more meaningful, is to facilitate comparisons across institutions and over time.

There is considerable variation, however, in how institutions, states and researchers define degree-seeking (Bailey, Crosta, & Jenkins, 2006, p. 4). One type of definition is based on students’ enrollment behavior, such as counting only students who register for a formal certificate or degree program (Jobs for the Future, 2008, Appendix F); who attempt or complete a given number of credits in their first year (Adelman, 2005; Moore, Shulock, & Offenstein, 2009, p. 6) or first two years (Voluntary Framework of Accountability [VFA], 2011, pp. 4–5); or who attempt or complete a specific set of academic courses for transfer to a four-year institution (Horn & Lew, 2007). Other definitions of degree-seeking are based on students’ stated intent to earn a certificate or degree (Jobs for the Future, 2008, Appendix F), and still others use some combination of students’ behavior and intent (Horn & Nevill, 2006, pp. 19–24; Shulock & Moore, 2007, p. 5). While the definition of degree-seeking is clearly articulated for some indicators, in many cases, it is ambiguous or absent altogether.

Even setting aside these differences in definitions, many community college students who might nominally be considered degree-seeking are in fact unsure of their goals (Horn & Lew, 2007). In fact, more than half of community college students change their educational objectives over time (calculated by author from figure 8 of Bailey, Jenkins, & Leinbach, 2005). Other students may claim to be degree-seeking so they can qualify for financial aid even if they have no intention of earning a certificate or degree (Offenstein & Shulock, 2009, p. 7).

Such inconsistencies can limit the comparability of indicators across colleges and states, but several national efforts are under way to address this issue. For example, clarifying and standardizing the definition of degree-seeking for community college students was one of the suggestions in the final report of the Committee on Measures of Student Success, the blue-ribbon panel convened by the U.S. Department of Education (Nelson, 2011). Likewise, the Voluntary Framework of Accountability established a uniform definition of degree-seeking based on enrollment behavior for community colleges that submit data to the initiative (VFA, 2011). Every indicator in *The Completion Arch* describes the population of students who are counted, including definitions of terms such as “degree-seeking,” as precisely as the data source permits.

At the start of each area in this report, an introductory section briefly describes the measures presented in *The Completion Arch* website. Every measure has a map showing which states have one or more indicators. Some measures are only available for a single state, others are available for a larger group of states, and still others are available for all 50 states. This section also notes which measures include a national estimate, an estimate for Achieving the Dream colleges, or both. (Appendix B summarizes the availability of indicators by state.)

[illegible]

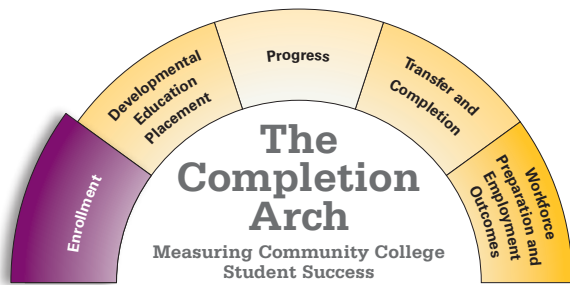
## *The Completion Arch* Website Overview

*The Completion Arch* website (<http://completionarch.collegeboard.org>) contains hundreds of indicators that depict community college student progress and success at the national, state and initiative levels. Indicators are organized within a framework that comprises five key areas: Enrollment, Developmental Education Placement, Progress, Transfer and Completion, and Workforce Preparation and Employment Outcomes. Each area includes two or more conceptual measures, and multiple indicators are presented within each measure.

Each indicator is made up of a graphical display of data accompanied by explanatory text describing what the data mean in terms of what is measured, who is counted, what it tells us and why it's important. Information about the data, including their limitations and caveats, is presented for every indicator.

*The Completion Arch* website also provides detailed contextual information explaining what the research tells us about each of the five areas and an annotated bibliography of all the literature cited. Other pages describe the main data sources for the indicators and introduce the project's advisory board.

As users explore indicators, they can choose to add those of interest to them to an Indicator List and download an aggregated indicator report. In addition, users may download data for each individual indicator and save a spreadsheet to their desktops. Experienced users may wish to go directly to the All Indicators page to view a single comprehensive list of all indicators arranged by area and measure. Likewise, users familiar with the indicators may go directly to the Build an Indicator List page to select indicators for an aggregated downloadable report by filtering on a data source or a specific state.



# Enrollment

## MEASURES

- Fall Enrollment
- Unduplicated Annual Enrollment

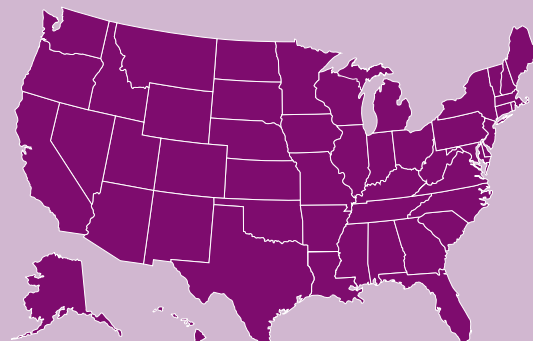
Enrollment indicators summarize the number and percentage of students enrolled each year in community colleges.

Community colleges report enrollment figures in two ways: the number of students enrolled in the fall and the number enrolled over a one-year period. Enrollment is broken out by students' race/ethnicity, degree-seeking status, and full- or part-time attendance status, among other characteristics.

# Measures Reported by State

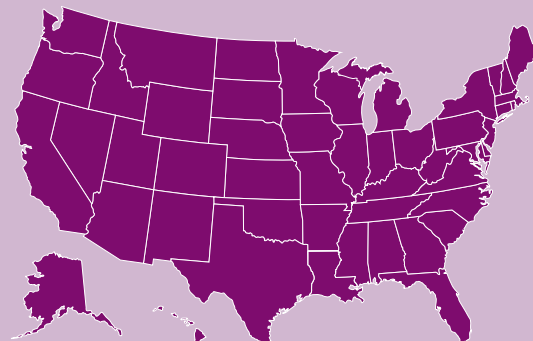
## Fall Enrollment

Fall enrollment includes students enrolled in courses creditable toward a degree or other formal award, students enrolled in courses in a vocational or occupational program, and high school students taking regular college courses for credit. The indicator shows the most recent data available for each state and nationwide in terms of the percentage of undergraduates enrolled in community colleges, their demographic characteristics, and the increasingly smaller shares of students identified as first time, full time and degree-seeking. Future updates of *The Completion Arch* will include enrollment trends over time. **This measure includes a national estimate.**



## Unduplicated Annual Enrollment

Unduplicated annual enrollment is the count of students enrolled over a 12-month period; each student is counted only once. Unlike in most four-year colleges, many community college students do not enroll in the fall but instead enroll in winter, spring or summer. Therefore, annual enrollment is a more accurate measure of the size of the community college student population than fall enrollment. **This measure includes a national estimate.**



**See Appendix B for a complete list of measures available by state.**

## What the Research Tells Us

**Enrollment has** a long history as an indicator of college access. Community colleges are generally open to all adults who wish to enroll, regardless of their qualifications, and this open access policy is reinforced by relatively low tuition and fees coupled with state-funding mechanisms that tie appropriations to enrollment. (In contrast, many four-year colleges strive to increase their selectivity by admitting the smallest fraction of applicants possible, and for-profit colleges seek to maximize revenue by admitting students only to the point that they can pay their tuition out-of-pocket and with outside financial aid.) A successful community college, by this benchmark, is one that enrolls the largest possible number of students.

The federal government has been collecting enrollment data since the 19th century, although it was not until the Higher Education Act of 1965 that it began to do so comprehensively and systematically (Brint, 2002; “The Higher Education Act of 1965,” 1965). This law established the Higher Education General Information Survey, later superseded by IPEDS, to collect enrollment and other statistics from postsecondary institutions. Because its data are collected annually and cover most postsecondary institutions, IPEDS is the preeminent source of enrollment data

for community colleges and other postsecondary institutions.

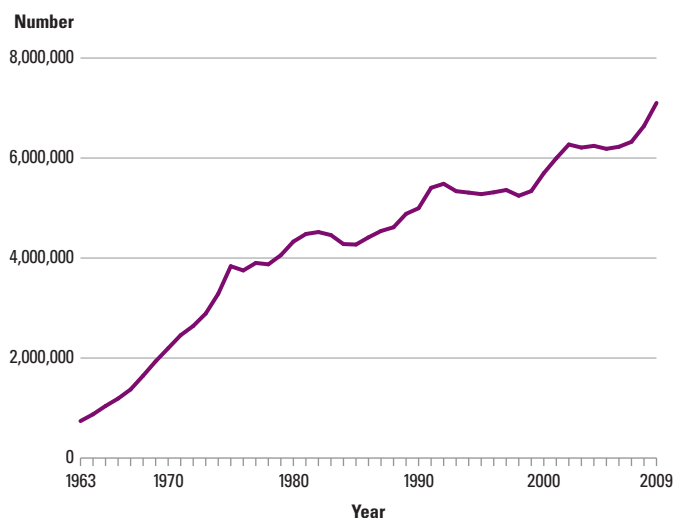
Today, community colleges make up the largest sector in postsecondary education. According to the 2008 National Postsecondary Student Aid Study (NPSAS:08), a nationally representative sample of college students enrolled in the 2007-08 academic year, 40 percent of undergraduate students were enrolled at community colleges, compared with 29 percent in public four-year colleges, 13 percent in private nonprofit colleges, 9 percent in private for-profit

colleges, 8 percent in multiple colleges, and less than 1 percent in public less-than-two-year colleges (calculated from Staklis, 2010, table 1.3).<sup>2</sup> Figure 1 shows the increase over time in the number of students enrolled in community colleges

<sup>2</sup> NCES surveys like NPSAS:08 are limited to students “enrolled in an academic program or [who have] taken at least one course for credit applicable toward an academic degree, or enrolled in an occupational or vocational program that required at least three months or 300 clock hours of instruction for receipt of a degree, certificate, or other formal award” (Cominole, Riccobono, Siegel, & Caves, 2010, p. 5). In addition, they count each student only once even if the student attends multiple institutions, so these proportions vary slightly from the IPEDS indicators discussed in the Enrollment area.

**FIGURE 1**

**Number of Students Enrolled in U.S. Community Colleges, Fall Term: 1963–2009**



SOURCE: Snyder, T. D., & Dillow, S. A. (2011). *Digest of education statistics, 2010* (NCES 2011-015), table 198; based on IPEDS data.

between 1963 and 2009. Community colleges and the students they serve are undergoing several transitions that make the need for high-quality, timely information about them ever more vital. As the United States struggles to emerge from the effects of the most recent recession, community colleges are being asked to retrain a massive wave of unemployed and underemployed individuals. Between fall 2007 and fall 2009, the number of community college students increased 12 percent, from 6.4 million students to 7.1 million students (Knapp, Kelly-Reid, & Ginder, 2009, 2011a, table 1 in both sources). Meanwhile, during this period, state appropriations to community colleges were shrinking, and per-pupil expenditures declined more steeply than in any other sector of higher education (Baime, 2011). This combination of growing enrollments and dwindling budgets is forcing community colleges to do more with less.

Even the very definition of community college is in flux as colleges themselves change to serve new missions. The

*As the United States struggles to emerge from the effects of the most recent recession, community colleges are being asked to retrain a massive wave of unemployed and underemployed individuals.*

National Center for Education Statistics (NCES) in the U.S. Department of Education defines community colleges as public postsecondary institutions in which the highest degree awarded is a two-year or associate degree (National Center for Education Statistics, n.d.-c; Provasnik & Planty, 2008). This definition is used in the IPEDS enrollment figures, which are the primary indicators of enrollment in *The Completion Arch*, as well as in other IPEDS and BPS indicators. Other sources in *The Completion Arch*, most notably Achieving the Dream and Complete College America, include public colleges that award bachelor's degrees if they make up a small fraction of the total awards. Once these definitions were nearly interchangeable, but in the last two decades, some community colleges have started to award bach-

elor's degrees in a limited number of fields. As a result, a number of community colleges have been reclassified as four-year institutions by NCES. By 2011, for example, some 17 states had authorized their community colleges to confer four-year degrees (Evelyn, 2003; Gonzalez, 2011). Although the decision to include or exclude community colleges awarding bachelor's degrees may make little difference for national and regional indicators of student success, it may have an appreciable effect in states such as Florida with a large population of students who are not seeking bachelor's degrees.

For a more in-depth review of the literature on Enrollment, see "What the Research Tells Us" on the Enrollment Web page.



## Fall Enrollment

Two measures of enrollment, both derived from IPEDS, are presented in *The Completion Arch*: fall enrollment and unduplicated annual enrollment. An institution's fall enrollment includes all students enrolled in credit-bearing courses on a day designated by the institution in the fall term or on October 15, broken down by race/ethnicity, gender, age, and full-time or part-time attendance (Jackson, Peecksen, Jang, & Sukasih, 2005; National Center for Education Statistics, n.d.-b). Both measures are collected and reported

annually by virtually all community colleges and other postsecondary institutions in the United States.

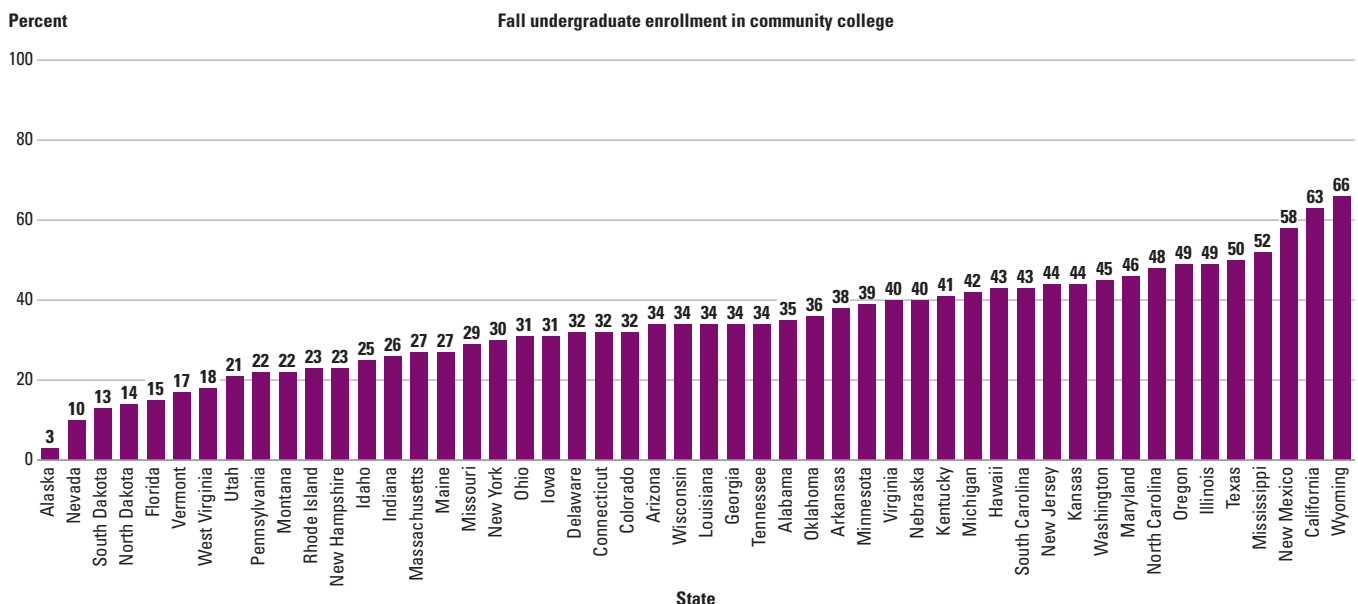
Fall enrollment has two characteristics in its favor. First, it is historically the most prominent and widely reported measure of college enrollment, mirroring the fall enrollment count of public elementary and secondary schools collected by NCES and other government agencies, so it is the most familiar indicator of enrollment. Second, it is connected to the retention and graduation statistics collected by IPEDS, which

are limited to first-time students who initially enroll in the fall term. On the other hand, the fall enrollment count excludes those students who enroll only in other terms. This distinction is particularly important for community colleges because many students enroll in other terms, as described in the next section.

The fall enrollment indicator measures the percentage of a state's undergraduates who are enrolled in community colleges (Figure 2). Nationally, community colleges enrolled 39 percent of

**FIGURE 2**

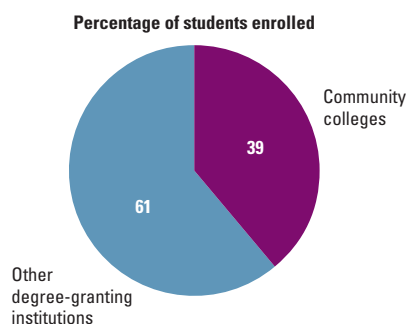
Percentage of Undergraduates in Community Colleges by State: Fall 2010



SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2010 (early estimates).

**FIGURE 3**

Percentage of Students Enrolled in Community Colleges: Fall 2010



SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2010 (early estimates).

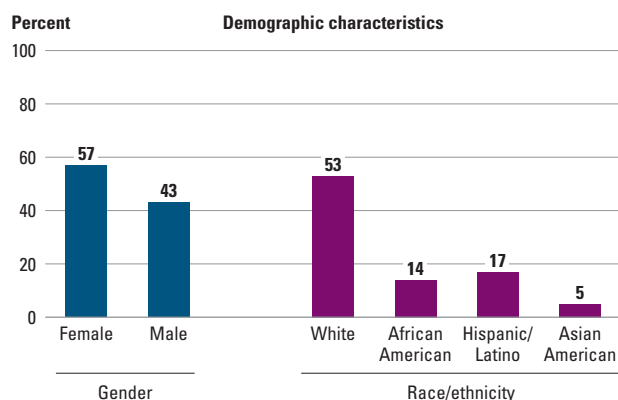
undergraduates in fall 2010 (Figure 3), but this statistic masks the wide variation in enrollment across states. At one end of the spectrum is Alaska with 3 percent of its undergraduates enrolled in community colleges in fall 2010, and at the other end is Wyoming with 66 percent of its undergraduates enrolled. Cross-state differences in community college enrollment are influenced by many factors, including local economic conditions, state postsecondary admission and transfer policies, geographic accessibility of community college campuses, the particular assortment of community college courses and programs of study offered, and the availability and relative cost of alterna-

tive education providers. Some of these factors are largely or completely outside the control of state and community college officials, while other factors are more directly shaped by state and local policymakers.

In *The Completion Arch*, the fall enrollment indicator provides the breakdown of students by gender and race/ethnicity (Figure 4). Also shown in this indicator is the demographic composition of community college students and the increasingly smaller shares of students who are degree-seeking (including certificate seeking); full-time; full-time degree-seeking; first-time degree-seeking; and first-time, full-time degree-seeking (Figure 5).

**FIGURE 4**

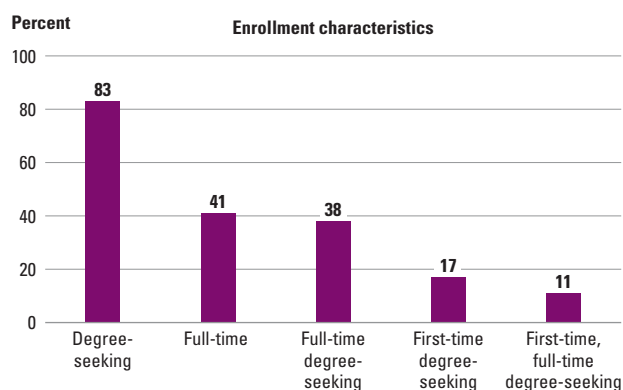
Percentage Distribution of Community College Students by Demographic Characteristics: Fall 2010



SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2010 (early estimates).

**FIGURE 5**

Percentage Distribution of Community College Students by Enrollment Characteristics: Fall 2010



SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), 2010 (early estimates).

## Unduplicated Annual Enrollment

The unduplicated annual enrollment (or unduplicated count or head count) includes all students enrolled within a 12-month period (typically July 1 through June 30 or September 1 through August 31), regardless of their first term of enrollment, and is broken down by race/ethnicity, gender and receipt of specific forms of financial aid (National Center for Education Statistics, n.d.-d). To the extent that students first enroll in terms other than the fall, the unduplicated annual enrollment is larger than the fall enrollment. Because so many community college students enroll in terms other than the fall, the difference is disproportionately greater for community colleges than it is for other postsecondary sectors. To illustrate, in the 2009-10 academic year, the unduplicated annual enrollment for community college students nationwide (10,989,210), which includes students who enrolled at any time, including the winter, spring and summer terms of that year, was 53 percent larger than the fall 2009 enrollment (7,160,664), which only includes students who enrolled in the fall of that year. However, the 2009-10 unduplicated annual enrollment for undergraduate students at public four-year institutions (7,547,034) was only 20 percent greater than the fall 2009 enrollment (6,285,149) (Knapp, Kelly-Reid, & Ginder, 2011a, 2011b). In this sense,

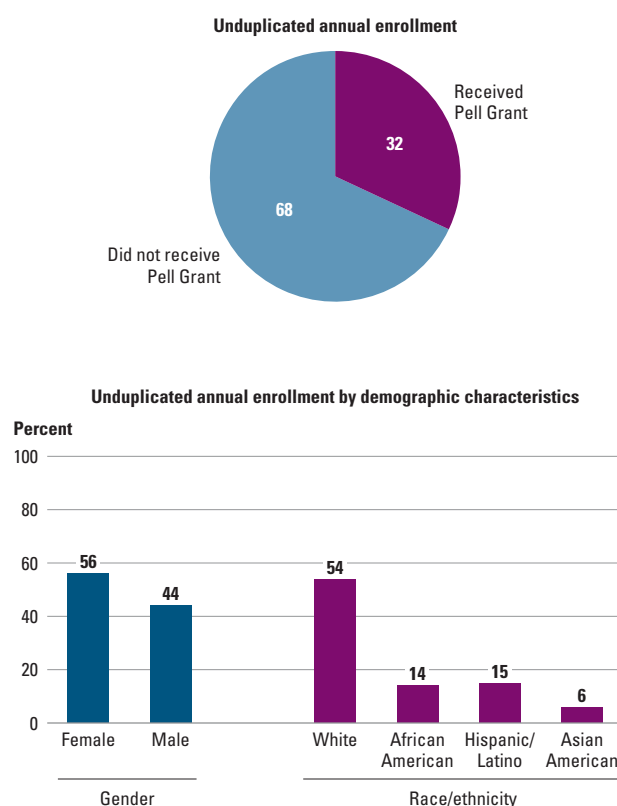
the unduplicated annual enrollment can be considered a more inclusive and representative indicator of enrollment, particularly for community colleges.

In *The Completion Arch*, unduplicated enrollment is broken out by Pell Grant status as a proxy for showing the share of the community college population

represented by low-income students (Figure 6, top panel). Pell Grants are awarded based on financial need and are given almost exclusively to low-income students. Unduplicated enrollment is also disaggregated by gender and race/ethnicity (Figure 6, bottom panel).

**FIGURE 6**

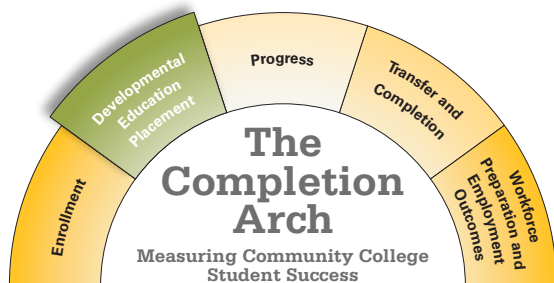
### Unduplicated Annual Enrollment: 2009-10



SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Fall 2010 (early estimates).

## Future Updates

One enhancement to *The Completion Arch* will be the addition of trends over time in fall enrollment and unduplicated annual enrollment. This will reveal recent trends in community college enrollment for each state and for the entire United States. And because IPEDS data are updated annually, both indicators in this area will be updated as new data are released.



## Developmental Education Placement

### MEASURES

- Placement in Developmental Courses
- Participation in Developmental Courses

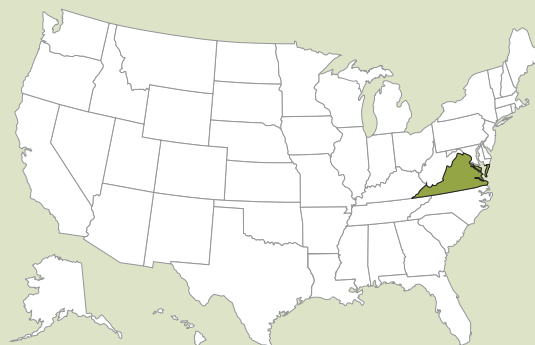
A majority of community college students take at least one developmental education course during their enrollment. Most colleges require students to take placement tests to determine if they need developmental education and, if so, at what precollege course level.

Developmental education policies vary across states and institutions. Some policies require students to take their referred level of course, while others allow students to take a course at a higher or lower level or to not take the course at all. Therefore, two placement measures are shown: the placement level at which students test, and the rate at which students take a developmental course regardless of placement. If data are available, placement statistics are shown separately for math, reading, writing, English and other combinations of subjects.

# Measures Reported by State

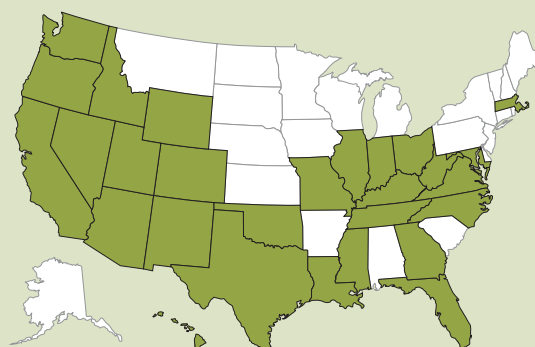
## Placement in Developmental Courses

Placement is the college's official assessment of the student's academic readiness in a given subject. In theory, it should be an accurate measure of need for developmental education; however, in practice, many students disregard the referral and enroll in a different level of developmental course in that subject, in a college-level course in that subject or in no course at all in that subject. **This measure includes an estimate for Achieving the Dream colleges.**



## Participation in Developmental Courses

Participation in developmental courses is simply a report of enrollment in developmental courses regardless of placement. Participation data are more widely available in state data systems and tend to be more consistently reported. **This measure includes a national estimate.**



**See Appendix B for a complete list of measures available by state.**

## What the Research Tells Us

### Developmental education

placement is particularly important to community colleges because their open-access admission policies and outreach to students from underserved groups mean that a much larger share of their students take developmental education courses than do those in other postsecondary sectors (Provasnik & Planty, 2008). College transcripts from a national survey of postsecondary students reveal that about two-thirds of community college students took a developmental education course over a six-year period between 2004 and 2009 (National Center for Education Statistics, n.d.-a). Other studies on developmental education estimate 58 percent to 63 percent of community college students nationwide take at least one developmental education course in reading, writing or mathematics at a level below the college

In one national study, two-thirds of community college students took a developmental education course.

level (Adelman, 2005; Attewell, Lavin, Domina, & Levey, 2006; Bailey, 2009).

Developmental education placement varies across and within states, but it typically begins with placement examinations at the time of enrollment (Collins, 2008; Dougherty & Reid, 2007; Perin, 2006) and occasionally includes auxiliary measures of college readiness such as the student's high school record (Hughes & Scott-Clayton, 2011). Students deemed unready for college-level course work in a particular subject are placed in (or "referred to") a developmental course in that subject at a specific level, such as one or two levels below the college level. As the indica-

tors in this area reveal, however, many students never actually enroll in the developmental courses to which they have been referred. In the Achieving the Dream sample, for example, 27 percent of students referred to developmental mathematics and 30 percent of students referred to developmental reading did not enroll in the respective developmental courses within three years (Bailey, Jeong, & Cho, 2010, table 3).

For a more in-depth review of the literature on developmental education placement, see "What the Research Tells Us" on the Developmental Education Placement Web page.

## Placement in Developmental Courses

Two measures of developmental education placement are defined in *The Completion Arch*: placement in developmental courses and participation in developmental courses. Most of the indicators distinguish between the *levels* of placement: one level below the college level, two levels below the college level, and so forth, and by subject (math, reading, writing and English).

In theory, placement in developmental courses should be a better measure of need for developmental education because it is the college's official assessment of the student's academic readiness in a given subject. In practice, however, many students disregard this referral and enroll in a different level of developmental course in that subject, in a college-level course in that subject or in no course at all in that subject (Bailey et al., 2010, pp. 260–261).

Moreover, when developmental education placement data are reported, they are often inconsistent or have incomplete coverage. In California community colleges, for example, student-level

placement data are not collected statewide (Perry, Bahr, Rosin, & Woodward, 2010, p. 8), so the California indicators in this area are limited to enrollment in developmental education courses only. Similarly, more than one-third of students in a study of Virginia community colleges were missing placement recommendations, and the proportion of missing data varied considerably by college (Roksa, Jenkins, Jaggars, Zeidenberg, & Cho, 2009, p. 2).

Another shortcoming of this measure is that developmental education placement procedures and policies vary across states, colleges and subjects (Hughes & Scott-Clayton, 2011), making it difficult to compare outcomes across students. Even if two students at different colleges received exactly the same score on exactly the same placement test in the same subject, one might be referred to a college-level course while the other might be referred to a developmental course (Bettinger & Long, 2009; Collins, 2008, p. 4).

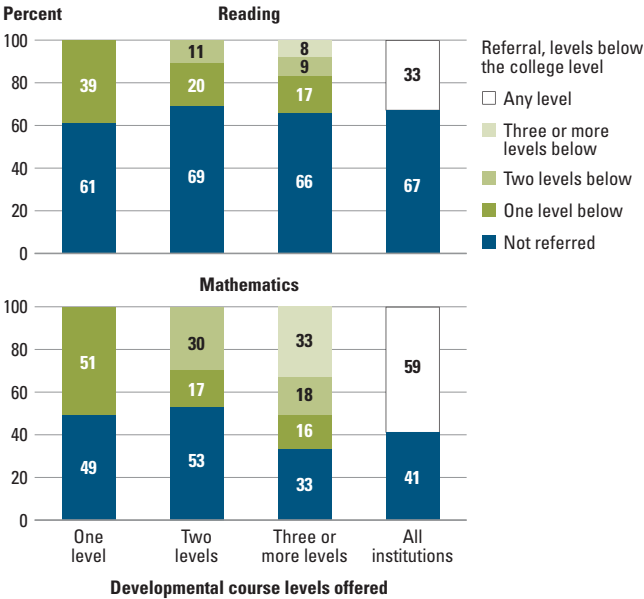
Placement in developmental courses is the college's official assessment of academic readiness, but the data are often inconsistent or have incomplete coverage.



The example indicator here shows that, overall, one-third of first-time degree-seeking students enrolled at Achieving the Dream (ATD) colleges were referred to developmental reading (Figure 7, top panel). The data illustrate how students are distributed across reading levels among institutions that offer one, two, three or more levels. It also shows that three-fifths of ATD students were referred to developmental math, and they were most likely to be referred to the lowest level (Figure 7, bottom panel). These results suggest that among those students who were not ready for college-level work, they were less prepared for math than they were for reading.

**FIGURE 7**

**Percentage of First-Time Degree-Seeking Students Enrolled in ATD Colleges in Fall 2003 to Fall 2004 Who Were Referred to Different Levels of Developmental Reading and Mathematics, by Levels Offered**



SOURCE: Bailey, T., Jeong, D. W., & Cho, S.-W. (2010). Referral, enrollment, and completion in developmental education sequences in community colleges. *Economics of Education Review*, 29(2), p. 259.

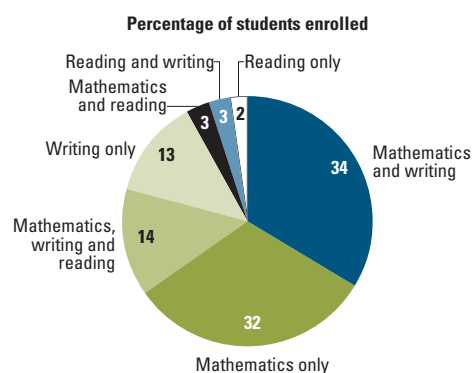
## Participation in Developmental Courses

Participation in developmental courses, the other *The Completion Arch* measure in this area, is simply a report of enrollment in developmental courses, regardless of placement. Participation data are more widely available in state data systems and tend to be more consistently reported. Results from ATD suggest that more than half of first-time degree-seeking community college students were referred to developmental education in at least one subject (Bailey et al., 2010, p. 259), which implies that most of these students needed at least one developmental course before advancing to college-level courses in that subject. If all students referred to developmental courses were to enroll where recommended, then participation in developmental education would be an accurate measure of the need for developmental education. However, some students ignore their referral and enroll directly in college-level courses.

When available, the developmental education participation indicators presented in *The Completion Arch* are broken out by subject and combinations of subjects. For example, the indicator shows the distribution of developmental subjects taken by first-time California community college students who enrolled in at least one developmental course within seven years of initially enrolling in fall 2002 (Figure 8). In this case, it is clear that developmental math is by far the most common subject taken. More than three-quarters of these students took developmental math either alone or in combination with reading and/or writing. By contrast, less than 10 percent of students took reading only or in combination with writing. The most common combination of subjects is math and writing (34 percent), followed by math only (32 percent) and by math, reading and writing (14 percent).

**FIGURE 8**

Participation in Developmental Math, Reading and Writing in California



NOTE: Total does not add to 100 percent due to rounding.  
SOURCE: Calculated from Perry, M., Bahr, P. R., Rosin, M., & Woodward, K. M. (2010). *Course-taking patterns, policies and practices in developmental education in the California community colleges*, figure 4.

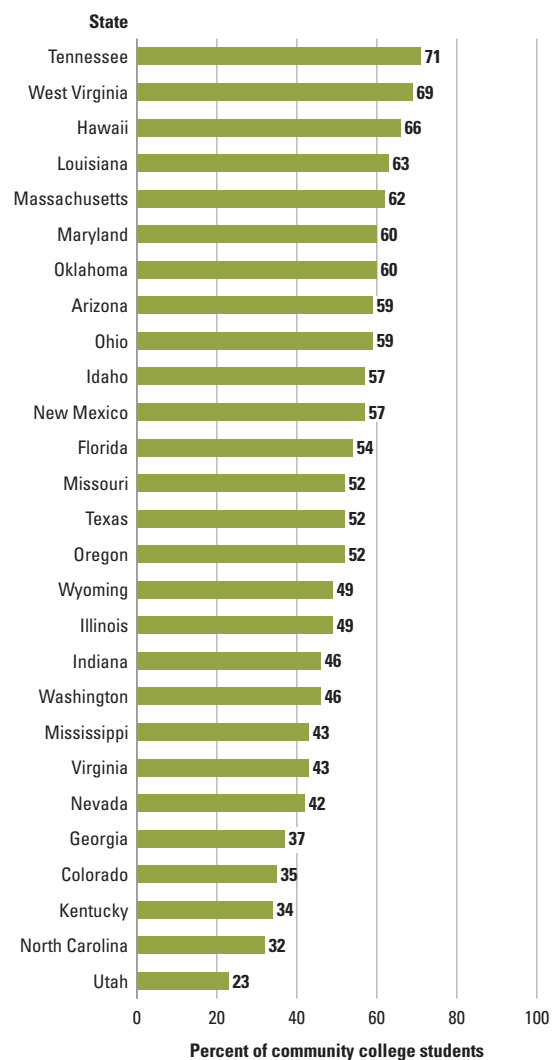
The second example combines indicators of enrollment in developmental education from states participating in Complete College America (CCA), a national nonprofit organization that collects and reports postsecondary data from participating states (Figure 9). Each of these 27 states reported the percentage of first-time students enrolled in both developmental math and English (including developmental reading).

The individual state indicators reported by CCA also show participation in developmental courses for students entering directly from high school and for students who initially received a Pell Grant (a commonly used measure of low income), which can be seen on *The Completion Arch* website. Variation across states in the percentage of incoming students taking developmental courses may reveal actual differences in their academic preparation or may merely reflect policy differences regarding developmental education. Either way, these indicators represent the proportion of community college students in each state who must spend time and money on courses that usually do not count toward a certificate or degree, but are, nonetheless, necessary to prepare students for college-level courses.

Placement and enrollment in developmental education courses may be the next step after students enroll, but it is far from the last. They also must complete these developmental courses as well as the college-level gatekeeper courses that follow. The next area, Progress, includes these and other intermediate measures of student progress and momentum.

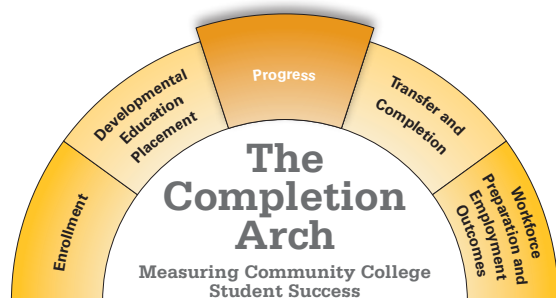
**FIGURE 9**

Percentage of Community College Students Enrolled in Developmental Math and English Courses During Their First Academic Year for 27 CCA States



SOURCE: Complete College America. (2011b, September). *Time is the enemy*, pp. 34–39.





## Progress

### MEASURES

#### Precollege Milestones

- Completion of the First Developmental Course
- Completion of Developmental Sequence

#### College Milestones

- Enrollment in Gatekeeper Courses
- Completion of Gatekeeper Courses
- Threshold Number of Credits in Specified Time
- Persistence Over Terms and Years
- Completion of Transfer Curriculum

#### Momentum

- Full-Time Attendance in First Term
- Completion of Courses Attempted
- Specified Credits Earned Within One Year
- Continuous Enrollment
- Summer Credits Earned

Intermediate measures of student progress are important for understanding and encouraging student goals and outcomes.

Researchers have organized indicators of progress into conceptual models that groups intermediate measures of progress into milestones and momentum points. Here, the term *milestones* refers to a set of precollege- and college-level achievements, excluding transfer to a four-year college and completion of certificates and degrees, while the term *momentum points* refers to student behaviors correlated with milestones, transfer and completion.

#### Precollege Milestones

Most beginning community college students need to take at least one developmental education course before they can begin earning college credits toward obtaining a credential or transferring. Progress toward completing these precollege requirements is a milestone for community college students.

For some students, passing the first developmental course in a subject is their first community college milestone. Completing the developmental course sequence in a subject by passing the highest-level developmental course is another major milestone and the final precollege milestone.

#### College Milestones

There are several common milestones that students must meet before attaining a credential or transferring to a four-year college. Progress toward completing these milestones is an important measure of student success.

Enrollment and completion of gatekeeper courses, the lowest-level college courses in core subjects such as English and math, are the first steps toward earning college-level credits for many students. Number of credits earned, persistence and completion of transfer curriculum are also indicators of student progress.

#### Momentum

*Momentum points* are specific enrollment and course-taking patterns. Although not necessarily achievements in and of themselves, research has shown that certain enrollment and course-taking patterns are predictors of student success. Among them are full-time enrollment, completion of attempted courses, credit accrual within one year, continuous enrollment and enrollment during summer terms.

# Measures Reported by State

## PRECOLLEGE MILESTONES

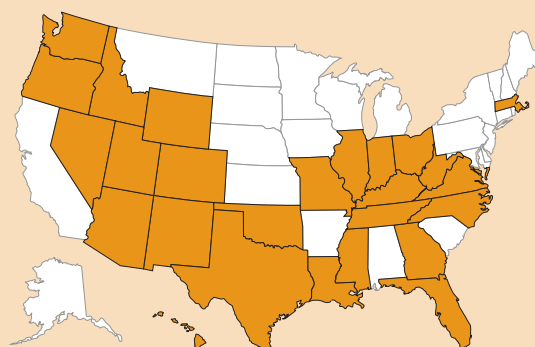
### Completion of the First Developmental Course

Most beginning community college students need to take at least one developmental education course before they can begin earning college credits toward obtaining a credential or transferring. For some students, passing the first developmental course in a subject is their first community college milestone.



### Completion of Developmental Sequence

Most beginning community college students need to take at least one developmental education course before they can begin earning college credits toward obtaining a credential or transferring. Completing the developmental course sequence in a subject by passing the highest-level developmental course is a major milestone and the final precollege milestone. **This measure includes an estimate for Achieving the Dream colleges.**



## COLLEGE MILESTONES

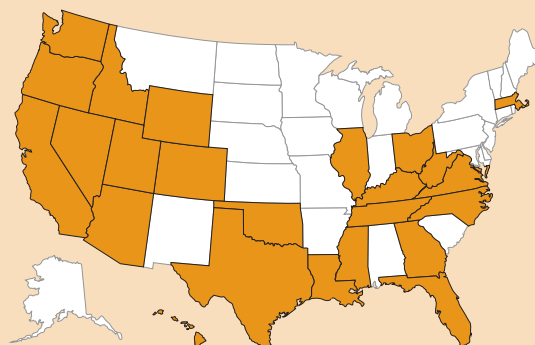
### Enrollment in Gatekeeper Courses

A gatekeeper course is the first or the lowest-level college course students take in a subject such as English or math. Most certificate, degree and transfer programs require students to pass gatekeeper courses in one or more subjects. **This measure includes an estimate for Achieving the Dream colleges.**



### Completion of Gatekeeper Courses

Completion of gatekeeper courses, the lowest-level college courses in the core subjects of English and math, is strongly associated with attainment of certificates and degrees and transfer to a four-year institution. Completion of gatekeeper courses fulfills requirements for graduation and transfer as well as prerequisites for more advanced courses in various fields. **This measure includes a national estimate and an estimate for Achieving the Dream colleges.**



# Measures Reported by State

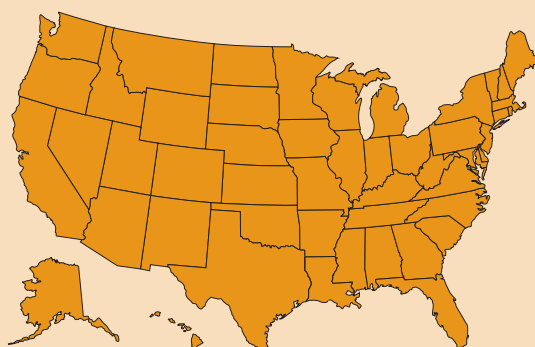
## Threshold Number of Credits in Specified Time

Students who intend to complete a program and obtain a credential or transfer to a four-year college must complete a required number of course credits. Earning a specific number of credits is a milestone that is associated with future success, and for students who are not interested in completing a formal credential, earning a certain number of college-level credits may constitute a goal in and of itself. **This measure includes a national estimate.**



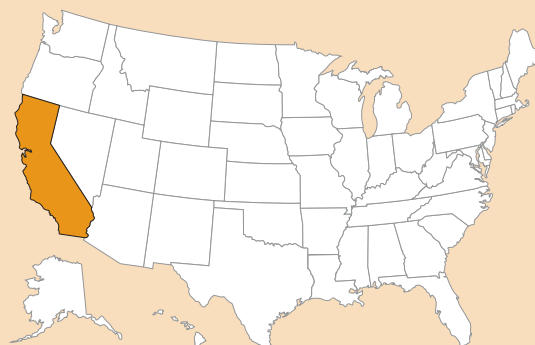
## Persistence Over Terms and Years

Most associate degree and transfer programs require the equivalent of two years of full-time enrollment and a longer period for part-time enrollment, so persistence beyond the first year is essential for many students to achieve their goals. **This measure includes a national estimate.**



## Completion of Transfer Curriculum

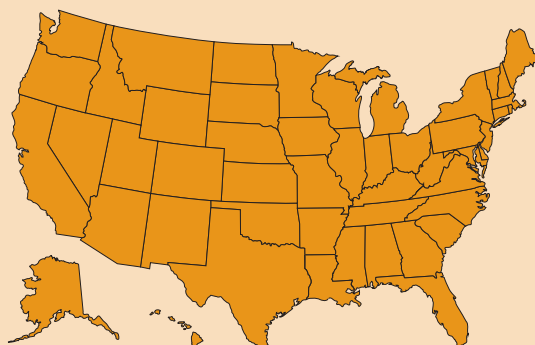
Completion of the transfer or general education curriculum is a milestone for transfer-bound students who may or may not attain an associate degree before they transfer. Community college students who complete a transfer curriculum usually do so to receive upper-division or junior-level standing when they transfer to a four-year institution. Students who transfer without completing a transfer curriculum, however, may spend additional time and money completing their general education courses at the four-year institution.



## MOMENTUM

### Full-Time Attendance in First Term

Community college students who enroll full time during their first term are more likely to persist and complete their program or transfer. Full-time students attempt more credits than part-time students, so they are better equipped to earn more credits in a shorter amount of time. **This measure includes a national estimate and an estimate for Achieving the Dream colleges.**



# Measures Reported by State

## Completion of Courses Attempted

Students who complete all the courses they attempt avoid having to repeat course work, accumulate credits faster, and take less time to attain a credential or transfer than students who fail to complete some courses. **This measure includes a national estimate.**



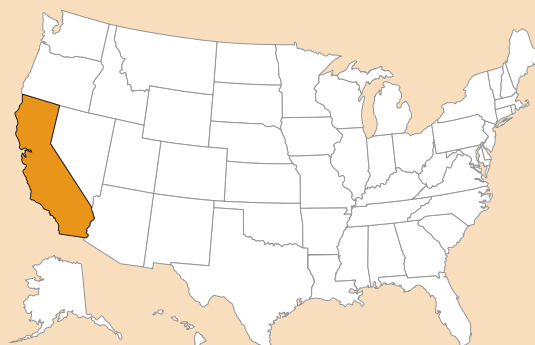
## Specified Credits Earned Within One Year

Researchers generally agree that students need to earn a certain number of credits during their first year to gain momentum toward completion and transfer. **This measure includes a national estimate.**



## Continuous Enrollment

Community college students who enroll continuously are more likely to transfer to a four-year college and to earn an associate degree. Continuous enrollment typically requires students to be enrolled in every term except the summer and brief winter terms. **This measure includes a national estimate and an estimate for Achieving the Dream colleges.**



## Summer Credits Earned

Taking classes in the summer expedites students' progress to degree attainment or transfer. Summer enrollment contributes to faster credit accumulation and reflects students' commitment to academic achievement. **This measure includes a national estimate.**



**See Appendix B for a complete list of measures available by state.**



## What the Research Tells Us

**Traditionally,** measures of community college students' success have been limited to the starting point (enrollment) and the ending point (completion or transfer to a four-year college) of their college experience. However, these measures do not take into account the "big black box" in the middle: different starting points (precollege and college), changing goals, enrollment mobility across two-year colleges and spells of nonenrollment. In recent years, interest has grown in defining and reporting intermediate measures of student progress. As institutional, system and state longitudinal data systems have grown in number, breadth and sophistication, it is increasingly common for colleges and state officials to measure and report the interim accomplishments of community college students.

Researchers have organized many of these indicators of progress into a conceptual framework that groups intermediate measures of progress into milestones and momentum points (Ewell, 2006; Leinbach & Jenkins, 2008). Although studies differ on the specific terms they use (Offenstein & Shulock, 2010), in *The Completion Arch*, *milestones* refer to a set of precollege- and college-level achieve-

**A growing body of research has found specific milestones and momentum points to reliably predict success in community colleges.**

ments, excluding transfer to a four-year college and completion of certificates and degrees (which are grouped in their own separate area). We further divide milestones into precollege level, which consists of completion of developmental education courses and sequences, and college level, which consists of completion of specific college-level courses, credit thresholds and persistence in community college. Momentum points, as defined in *The Completion Arch*, are behaviors associated with successful outcomes, such as attending full time and completing courses attempted. A growing body of research has found these milestones and momentum points to reliably predict success in community colleges, even after statistically controlling for other factors, including demographic characteristics and academic preparation (Offenstein, Moore, & Shulock, 2010; Moore, Shulock, & Offenstein, 2009; Leinbach & Jenkins, 2008; Calcagno et al., 2006; Adelman, 2005).

Interest in tracking these progress measures is emerging from several quarters, but reasons for doing so vary. First and foremost, some milestones may be valuable even if they do not lead to a credential or transfer to a four-year institution, especially given the large proportion of community college students who are not seeking either goal or who are unsure of their educational objectives (Horn & Lew, 2007). For such students, earning a certain number of college-level credits may be a goal in and of itself, whether their ultimate objective is to improve their workforce skills, cultivate their personal interests or accomplish something other than a degree or transfer. To illustrate, a recent study estimated that both women and men who left a community college without completing a credential had an increase in earnings of 10 percent and 9 percent, respectively, compared with individuals who had never attended college at all (Belfield & Bailey, 2011).

Community college officials also can track milestones and momentum points to encourage behaviors correlated with measures of success such as completion and transfer. They can concentrate resources on groups with historically low rates of progress and even target assistance to individual students who fail to progress through a community college in a timely fashion.

Finally, community colleges may use progress measures to inform law-

makers and taxpayers about student accomplishments not fully captured by traditional accountability measures such as enrollment counts and graduation rates (Bearer-Friend, 2009). Thus, this more extensive array of measures offers an alternative, and arguably more accurate, accounting of student success.

Although an increasing number of states are reporting measures of pre-college and college milestones and

momentum points, colleges do not follow a consistent framework in reporting such data. In addition, course work requirements vary across colleges and across certificate, degree and transfer programs, making comparisons of course work milestones all the more difficult.

For a more in-depth review of the literature on Progress, see “What the Research Tells Us” on the Progress Web page.

## PRECOLLEGE MILESTONES

# Completion of Developmental Education Courses and Sequences

As noted earlier, some two-thirds of first-time community college students take at least one developmental education course in math or English (reading, writing or both), and many need to complete a sequence of two or more developmental education courses. For these students, completing the first developmental course in a subject is the first precollege milestone toward enrolling in college-level courses. Likewise, completion of the entire developmental course work sequence in a subject, whether it is one level below college or multiple levels below college, is an important precollege milestone for students seeking to earn a degree or transfer. To address increasing calls for accountability, a growing number of states are reporting developmental education enrollment and completion rates. Currently, though, estimates are limited to a handful of states and institutions participating in national initiatives.

For students referred to the highest level of a developmental education course, there is only one course to

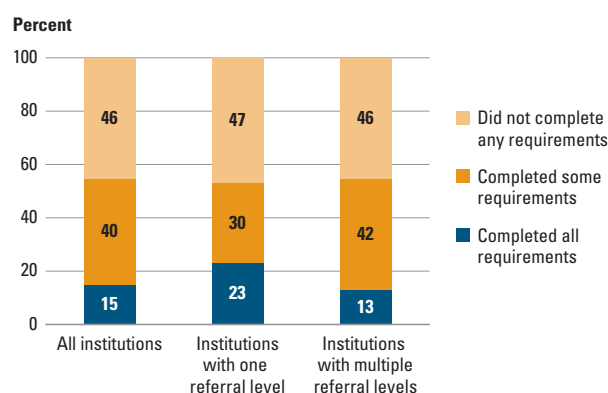
complete, and the two milestones — completion of the first course and completion of a sequence — are one and the same. The same is true at institutions that offer only one level of developmental education in a subject. An example from Achieving the Dream colleges demonstrates the variation in course placement policies based on

institutional offerings (Figure 10).

Students at institutions that offer only one level of developmental education had considerably higher sequence completion rates than their peers at institutions with multiple levels of developmental education. However, noncompletion rates across institution types were the same.

**FIGURE 10**

## Completion of Developmental Education Requirements in ATD Colleges



NOTE: Results are for first-time degree-seeking students enrolled in Achieving the Dream (ATD) colleges in fall 2004 to fall 2005 who were referred to developmental education. Percentages may not sum to 100 because of rounding.

SOURCE: Clery, S. & Topper, A. (2008, July/August). *Developmental education: Completion status and outcomes*. Data notes, 3 (4). Achieving the Dream.

## COLLEGE MILESTONES

# Enrollment in and Completion of Gatekeeper Courses

A gatekeeper course is generally defined as the first college-level course in a subject and is typically the first course taken after completing a developmental sequence. Enrolling in and completing gatekeeper courses are often the first steps toward earning college-level credits, and therefore, they represent the first two college milestones. Completion of gatekeeper courses determines whether or not a student can continue on to more advanced-level course work required for a credential or for transfer to a four-

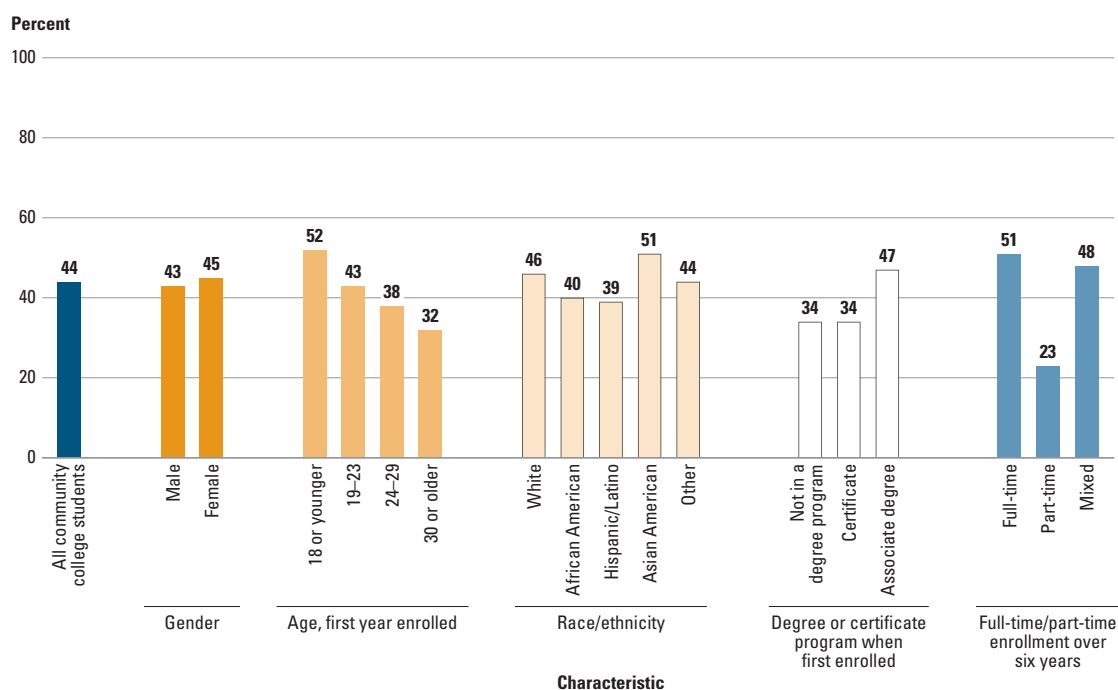
year institution. Despite the obvious value of these milestones as measures of student success, few states report estimates of enrollment in and completion of gatekeeper courses. And even where such data do exist, requirements for and definitions of completion of gatekeeper courses vary widely enough that it is not always possible to make meaningful comparisons across institutions and states.

The following indicator from the nationally representative 2003-04 Beginning

Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09) sample shows the percentage of community college students who completed any college-level math course (including gatekeeper or more advanced-level courses) within six years of first enrolling (Figure 11). Although there was no appreciable difference between the percentage of men and women who completed a college-level math course within six years, students age 18 or younger were more likely than students age 19 or older to do so.

**FIGURE 11**

## Completion of Gatekeeper Math Courses



SOURCE: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09) Postsecondary Education Transcript Study (PETS:09).

## COLLEGE MILESTONES

# Threshold Number of Credits in Specified Time and Completion of Transfer Preparatory Courses

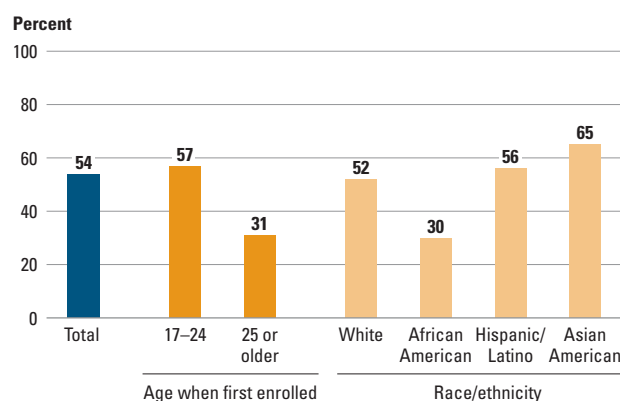
In addition to completing gatekeeper courses, students usually must earn a specific number of credits (or an equivalent amount of clock or contact hours) or complete an articulated curriculum to obtain a credential or transfer to a four-year institution.<sup>3</sup> These minimum requirements must be met for a student to progress through college and therefore are considered milestones.

Indicators denoting transfer curriculum completion are rare, in no small part because of the lack of uniformity across states, institutions and academic programs in what courses community college students must take to receive junior-level or upper-division standing at a four-year institution. For example, California public universities require community college transfers to successfully complete at least 60 transferable credits to receive upper-division standing, although specific course requirements vary by program and by four-year institution (Moore, Shulock, & Jensen, 2009, p. 7). Figure 12, for example, shows the estimated percentage of California community college students

who completed minimum transfer admission requirements (defined as having completed at least 60 transferable credits, including one math and one English course) among all those who transferred to a four-year institution (Moore, Shulock, & Offenstein, 2009, p. 10). Overall, about 54 percent of students who transferred completed a transfer curriculum beforehand.

**FIGURE 12**

**Among California Community College Transfer Students, Percentage Who Completed a Transfer Curriculum Prior to Transferring**



NOTE: Results were not reported for other race/ethnicity categories.  
 SOURCE: Moore, C., Shulock, N., & Offenstein, J. (2009, October). *Steps to success: Analyzing milestone achievement to improve community college student outcomes.*

<sup>3</sup> The term *curriculum* as used here simply means completing a defined set of preparatory courses.

## COLLEGE MILESTONES

# Persistence

Persistence beyond the first year is a milestone for most community college students. Almost all associate degree programs and transfer programs require the equivalent of two years of full-time enrollment to complete a certificate or degree, and even more time for part-time enrollment. Some certificate programs can be completed in one year or less of full-time enrollment, but even these may require more than one year of part-time enrollment. Most students, then, must persist at a minimum into their second year of college, if not beyond, to complete a certificate or degree. The one-year per-

sistence rate reported by the Integrated Postsecondary Education Data System (IPEDS) provides a standardized procedure for institutions to report persistence, but it is limited to students who remain enrolled in the community college where they first started. In the indicator using national IPEDS data (not shown here), about 60 percent of first-time, full-time U.S. community college students persisted to their second year, while just 42 percent of first-time, part-time students did so. Other data sources, such as BPS:04/09, can track student persistence across different institutions.

Most students must persist into their second year of college to complete a certificate or degree.

## MOMENTUM

## Full-Time Attendance in First Term

In addition to precollege and college milestones, certain patterns of enrollment and credit accrual that are not essential to completion or transfer to a four-year institution are positively associated with these outcomes. The first of these momentum points is full-time attendance in the first term, which is usually defined as attempting at least 12 credits or at least 24 contact hours a week. By definition, full-time students attempt more credits than part-time students, so they are better able to earn a substantial number of credits during their first year. Not all students who enroll full time in their first term will enroll full time in all subsequent terms, but the research shows that community college students who start full time are more likely to complete a credential, transfer and persist in college over the first three years than those who initially enrolled part time (Clery, 2010, figure 4; Topper & Lee, 2010). Also, for this reason, all indicators in *The Completion Arch* are disaggregated by full-time or part-time enrollment, whenever possible.

For degree-seeking students who first enroll in the fall term, this measure can be calculated from IPEDS statistics, which indicate that 62 percent of community college students who first enrolled in fall 2010 enrolled full time in their first term. However, this indicator does not include students who first enrolled in other terms or students who were not seeking a degree. For comparison, in the BPS:04/09 national sample, which includes students who enroll in terms other than the fall and students who are not seeking a certificate or degree, 52 percent of first-time community college students were enrolled full time in their first month (indicator not shown) (National Center for Education Statistics, n.d.-a). Nor does the IPEDS statistic show differences in full-time enrollment among subgroups, such as older and younger students, which can be considerable (Offenstein & Shulock, 2009, p. 8).

Research shows that community college students who start full time are more likely to complete a credential, transfer and persist in college.

## MOMENTUM

# Completion of Courses Attempted

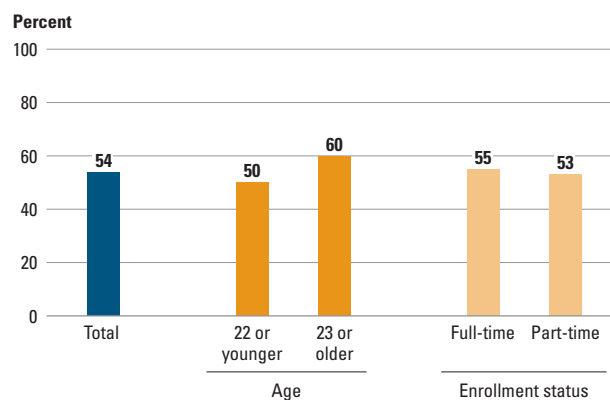
Students who complete all the courses they attempt avoid having to repeat course work, accumulate credits faster and take less time to attain a credential or transfer than students who fail to complete some courses. Incomplete courses may result from a failing grade or withdrawal. Multiple studies have found that excessive course withdrawals may reduce students' likelihood of completion and transfer (Adelman, 2005, tables 32, 33, 42; Cabrera, Burkum, & La Nasa, 2005; Chen, 2005; Offenstien et al., 2010, figure 14).

Several states measure the course completion rate of community college students, typically in terms of the proportion of students who passed at least 80 percent of the credits they took in their first year. For example, 54 percent of North Carolina community college students completed at least 80 percent of the credits they attempted in their first year, with older students more likely than younger students to reach this momentum point (Figure 13).

The BPS:04/09 indicator (not shown here), which uses a slightly different method to calculate the figure, reveals that U.S. community college students completed an average of 77 percent of the credits they attempted, including those attempted at other colleges, up to six years after first enrolling.

**FIGURE 13**

**Completion of At Least 80 Percent of Course Credits Attempted in First Year, North Carolina Community College Students**



NOTE: Results are for first-time degree-seeking students who first enrolled in fall 2004.  
SOURCE: North Carolina Community College System, Office of the President. (2009, September 11). *Data trends and briefings*, p. 3.



## MOMENTUM

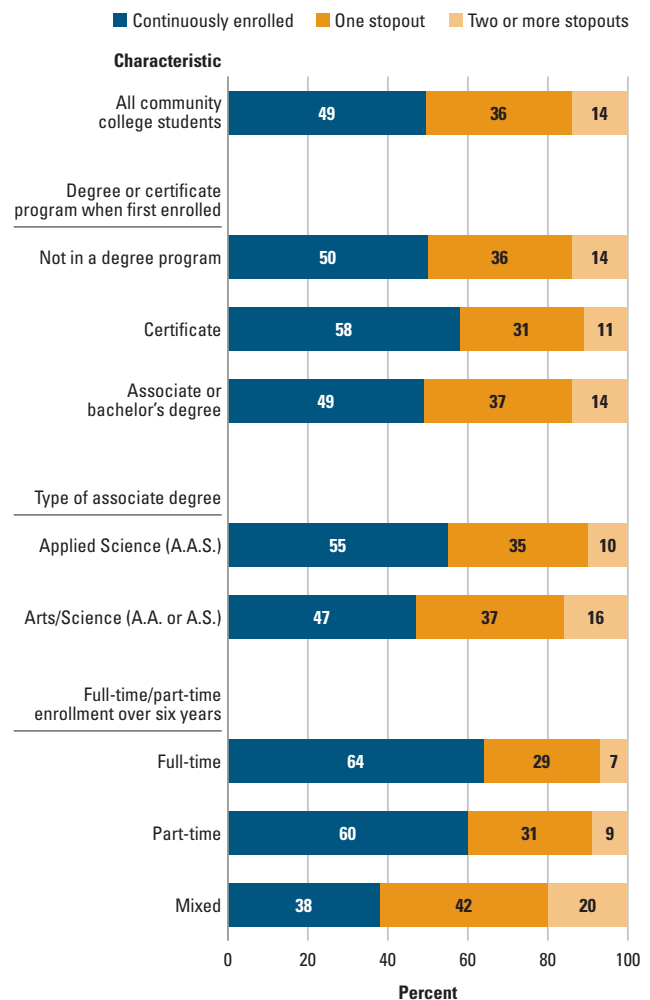
## Continuous Enrollment

Community college students who enroll continuously — that is, without stopping out for one or more regular terms — are much more likely to transfer to a four-year college and to earn an associate degree (Adelman, 2005, tables 32, 33; Offenstien et al., 2010, figure 15). Continuous enrollment typically requires students to be enrolled in every term except the summer and brief winter terms (Clery, 2010, notes 4, 7; Skomsvold, Radford, & Berkner, 2011, p. G8), whereas persistence usually only measures students' enrollment at two points in time. This distinction can be illustrated by a hypothetical example: a student who first enrolled in the fall, did not enroll the following spring and then enrolled again the following fall would have persisted according to the IPEDS definition of persistence, but was not enrolled continuously for one or more years.

The indicator of continuous enrollment from BPS:04/09 tracks the percentage of community college students who were enrolled continuously for the duration of their enrollment and the percentage who stopped out once or two or more times (Figure 14). Overall, about half of students attended continuously, 36 percent stopped out once, and another 14 percent stopped out two or more times over the six years they were followed. Students starting in a certificate program were more likely to enroll continuously than students in an associate or a bachelor's degree program, and students pursuing an occupational or technical associate degree (A.A.S.) were more likely to attend continuously than students pursuing a general education or transfer associate degree (A.A. or A.S.). Because BPS:04/09 tracks students across institutions, some reported stopouts may have occurred at other institutions.

FIGURE 14

Number of Enrollment Spells After Six Years, U.S. Community College Students



NOTE: *Stopout* is defined as a break in enrollment of more than four months. Enrollment spells may take place over more than one institution and end with a student stopping out or leaving without returning. Percentages may not sum to 100 because of rounding.  
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

## MOMENTUM

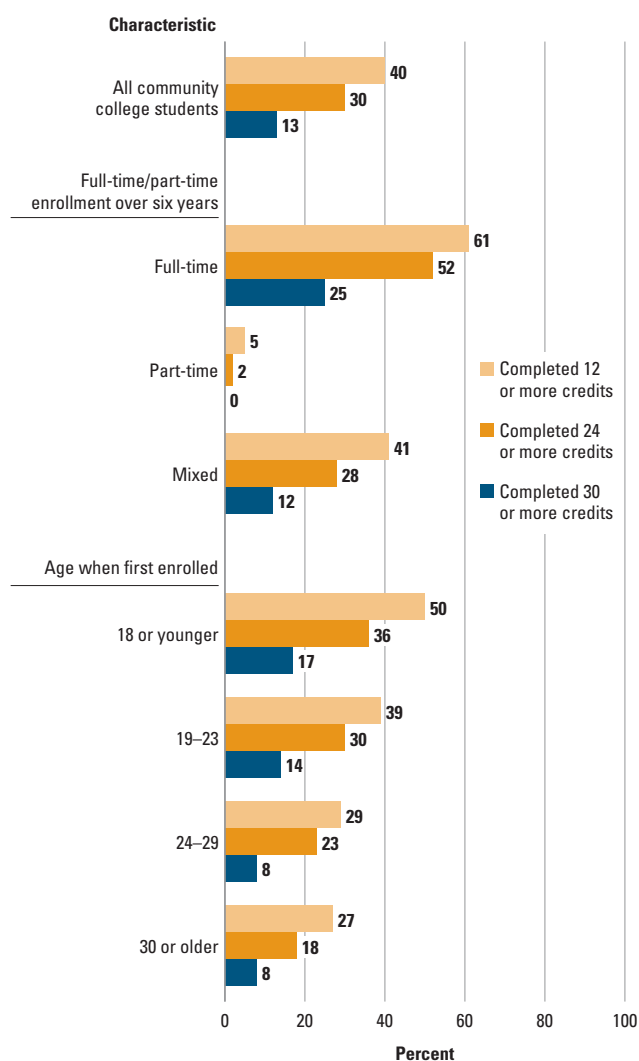
## Credits in First Year

A few states report the percentage of students who earn a threshold number of credits in a specified time such as the first year. Credit accumulation, particularly in the first year, is associated with completion and transfer and is considered a good early indication that students are on track to meet these goals (Calcagno et al., 2006; Chen, 2005; Moore & Shulock, 2009; Roksa & Calcagno, 2008). Credit thresholds are based on meaningful benchmarks, such as 12 credits (the minimum number most students must take to be enrolled full time) or 30 credits (the number most students must complete each year to earn an associate degree in two years).

This indicator from BPS:04/09 shows the percentage of community college students nationally who completed 12 or more credits, 24 or more credits, or 30 or more credits in one year (Figure 15). Two-fifths of community college students completed 12 or more credits within their first year, while 30 percent completed 24 or more credits, and 13 percent completed 30 or more credits. This indicator also highlights the strong relationship between full-time enrollment and credit accumulation. Even after a year, just 5 percent of exclusively part-time students completed 12 credits, only 2 percent completed 24 credits and less than 1 percent completed 30 credits.

FIGURE 15

One-Year Credit Milestones, U.S. Community College Students



SOURCE: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09) Postsecondary Education Transcript Study (PETS:09).

## MOMENTUM

## Summer Credits Earned

Earning credits during the summer term, like enrolling full time, is another means for community college students to accumulate credits faster. Studies have found that students who earned credits in the summer are considerably more likely to transfer to a four-year college and to earn an associate degree than students who did not earn credits in the summer, even after controlling for student background and other academic behaviors (Adelman, 2005, tables 32, 33; Moore, Shulock, & Offenstein, 2009, figure 9 and table A-2; Offenstein et al., 2010, figure 13). At present, California is the only state to report this momentum point, where 46 percent

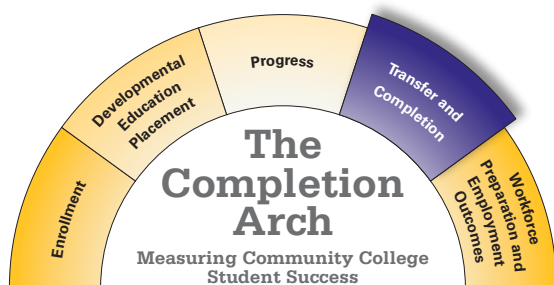
of first-time degree-seeking community college students earned summer credits within seven years (indicator not shown here). Similarly, the indicator from BPS:04/09 (not shown here) reveals that 44 percent of U.S. community college students completed summer credits within six years. Nearly half of women (49 percent) completed summer credits, compared with just 38 percent of men. Also, students who took at least one developmental education course completed summer credits more often than students who never took developmental education courses (47 percent vs. 40 percent).

Students who earned credits in the summer are considerably more likely to transfer to a four-year college and to earn an associate degree.

## Future Updates

As states and community colleges devote more attention and resources to measuring and reporting intermediate measures of student achievement, more indicators of progress will become available and other measures will be included in the framework as well. For enrolled and prospective community college students lacking a high school diploma, earning a GED (General Educational Development) certificate or

its equivalent is often the first precollege milestone. Early warning signs for students presumed to be at high risk of dropping out of community college — based on behaviors such as late registration (Offenstein et al., 2010, figure 15), delayed entry into a program of study (Moore & Shulock, 2011), earning poor grades or failure to file for financial aid — may alert colleges to intervene on their behalf.



## Transfer and Completion

### MEASURES

- Graduation Rates
- Number of Degrees and Certificates Awarded
- Completion Rates Within Six Years
- Persistence Without a Degree After Six Years
- Time to Degree
- Credits to Degree
- Near Program Completion After Six Years

Most beginning community college students intend to earn a certificate or a degree. Thus, understanding of their academic progress is critical to increasing the rates at which students complete community college.

Academic progress at community colleges is measured in a number of ways, including graduation rates at and beyond a specified time, the number of degrees and certificates awarded, student persistence, time to degree, and credit accrual.

## Graduation Rates

A map of the United States with state boundaries outlined in black. The map includes all 50 states, with Alaska and Hawaii shown separately from the main continental United States.

For detailed background data and additional information, please visit <http://completionarch.collegeboard.org>.

## Time to Degree

[illegible]

This measure represents those community college students who left before completing a certificate or degree or who transferred to a four-year college but nonetheless made significant academic progress while enrolled. Some students who make progress toward completing a credential may have achieved their educational goals (such as acquiring specific job skills), while others would be well on their way toward completion or transfer if they decide to return to a community college. **This measure includes an estimate for Achieving the Dream colleges.**

For detailed background data and additional information, please visit <http://completionarch.collegeboard.org>.

## What the Research Tells Us

**Completion of degrees** and certificates and transfer to four-year institutions are instrumental to the educational and career goals of community college students. Research shows that individuals who earn a certificate or associate degree are more likely to be employed and earn more on average than individuals whose highest level of education is a high school diploma, and the outcomes are even better for individuals who earn a bachelor's degree (for example, see Baum, Ma, & Payea, 2010, part 1), although results for bachelor's degree holders usually include individuals who did not transfer from community colleges.

The national imperative to increase the college attainment of American adults requires colleges to increase the number of students who complete postsecondary certificates and degrees. Despite some debate on how to interpret international statistics, few dispute that the United States lags behind many industrialized countries in the proportion of adults with an associate degree or higher or its equivalent (Adelman, 2009). And as discussed in the following section, the projected growth in employers' demand for individuals with associate degrees, which exceeds even the growth in demand for individuals

The United States lags behind many industrialized countries in the proportion of adults with an associate degree or higher.

with bachelor's degrees and postgraduate degrees (Lacey & Wright, 2009, table 3), means that community colleges are vital in efforts to ensure that students graduate in a timely fashion.

Certificates and associate degrees already represent about half of undergraduate awards conferred in the United States (National Center for Education Statistics, n.d.-e), and the number of associate degrees awarded is projected to outpace that of bachelor's degrees (calculated from Hussar & Bailey, 2011, tables 32, 33). Measures of transfer and completion are portrayed in numerous ways, including graduation rates at and beyond normative time, longitudinal completion rates, the average time to earn a certificate or degree, number of certificates and degrees awarded, credits earned, and persistence.

Although many of these portrayals fit conceptually within established measures of community college completion, some do not take into account the unique model of community colleges. For example, transfer and

graduation rates measured using the normative time of two years exclude the large share of students who attend part time and also do not account for the longer time frame required by many students who need developmental education before enrolling in a college curriculum. Using a short time frame also excludes students who continue to persist in community colleges well beyond normative time or who return to community colleges after extended periods of not being enrolled. On the other hand, as many of the indicators presented in *The Completion Arch* demonstrate, reporting completion rates beyond the normative time, reporting separate measures for part-time students and students who enroll in developmental courses, and accounting for students who continue to persist all contribute to a broader, more realistic accounting of students' success in community colleges.

For a more in-depth review of the literature on Transfer and Completion, see "What the Research Tells Us" on the Transfer and Completion Web page.



## Graduation Rates, Time to Degree and Completion Rates Within Six Years

The institutional graduation rate reported in the Integrated Postsecondary Education Data System is the most well-known indicator of community college completion. The IPEDS graduation rate is reported annually according to a standard formula and can be compared over time and across states and individual institutions. Over time, the IPEDS graduation rate has become a key component of college rankings and state accountability systems for public colleges.

But the IPEDS graduation rate has several notable limitations. Most prominently, it includes only first-time, full-time students who begin in the fall, thus excluding the majority of community college students who initially enroll part time or in other terms (Offenstein & Shulock, 2009). To address this shortcoming, one of the recommendations of the federal Committee on Measures of Student Success is to expand IPEDS to include separate graduation rates for part-time community college students (Nelson, 2011). Even then, a third of students who are included in the IPEDS rate will enroll part time for at least one term over the three years they are tracked (Bailey, Crosta, & Jenkins, 2006; Offenstein & Shulock, 2009). In addition, until recently, IPEDS estimates reported graduation rates within, at most, 150 percent of normative time, or three years. Six-year completion rates

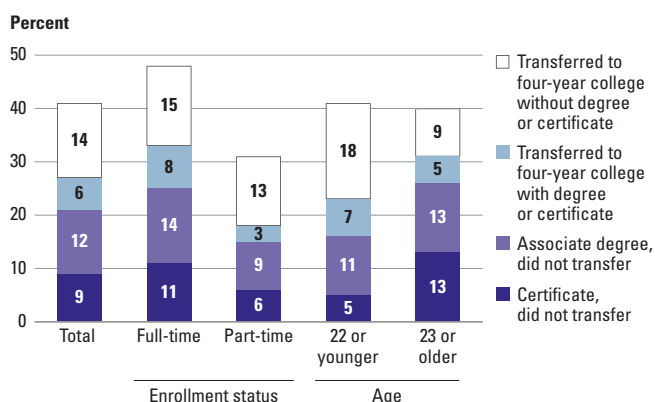
provide a more realistic time frame for students who enroll part time or who are not enrolled continuously or who require developmental education to complete community college course work in order to transfer or earn a degree or certificate.

Several states have begun reporting six-year completion rates, and national initiatives such as Achieving the Dream have contributed toward promoting this measure across a number of states and institutions. An example from North Carolina illustrates the difference between the IPEDS graduation rate and completion rates reported at six years.

The IPEDS graduation rate at 150 percent of normative time, which is equivalent to three years for associate degrees or varying lengths of time for certificates, is only 20 percent for North Carolina. In contrast, as shown in Figure 16 in the Total bar, 41 percent of North Carolina community college students had completed after six years, a measure that also includes transfer to a four-year college. The six-year completion rate is also calculated separately for students who initially enrolled part time and illustrates how a greater percentage of full-time students than part-time students reach every category of completion.

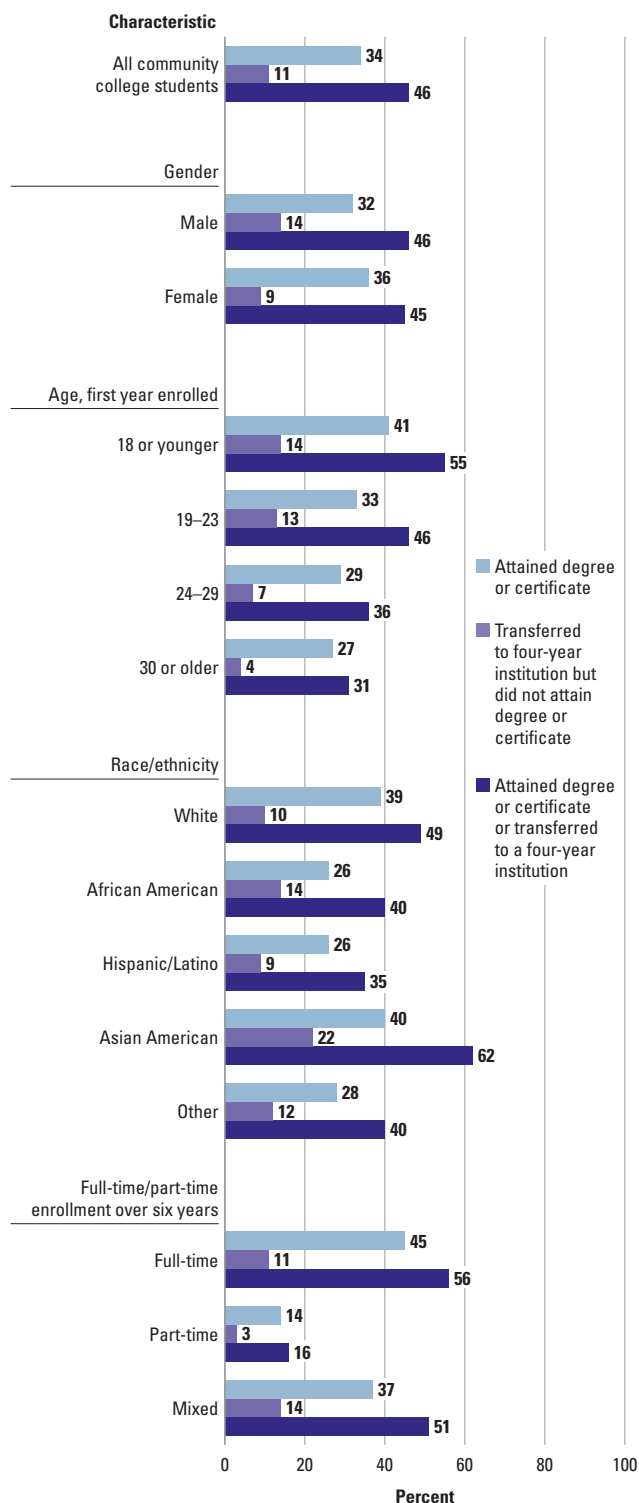
**FIGURE 16**

**Percentage of Students Completing Within Six Years, North Carolina Community Colleges**



NOTE: Results are for all first-time degree-seeking students who entered in fall 2002.  
SOURCE: North Carolina Community College System, Office of the President. (2009, September 11). *Data trends and briefings*, pp. 12–13.

These results correspond to national statistics, which show that while 14 percent of all community college students (both full time and part time) completed a degree or certificate within three years (Horn, 2009, table 8), the percentage more than doubled to 34 percent after six years. Moreover, if students who transferred to a four-year college but had not attained a degree are included in the completion rate, the figure stood at 46 percent. Figure 17 shows the six-year completion rate from BPS:04/09, which reports attainment and transfer separately and combined for a nationally representative sample of first-time community college students.

**FIGURE 17****Six-Year Completion Rates for U.S. Community College Students**

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

## Number of Degrees and Certificates Awarded

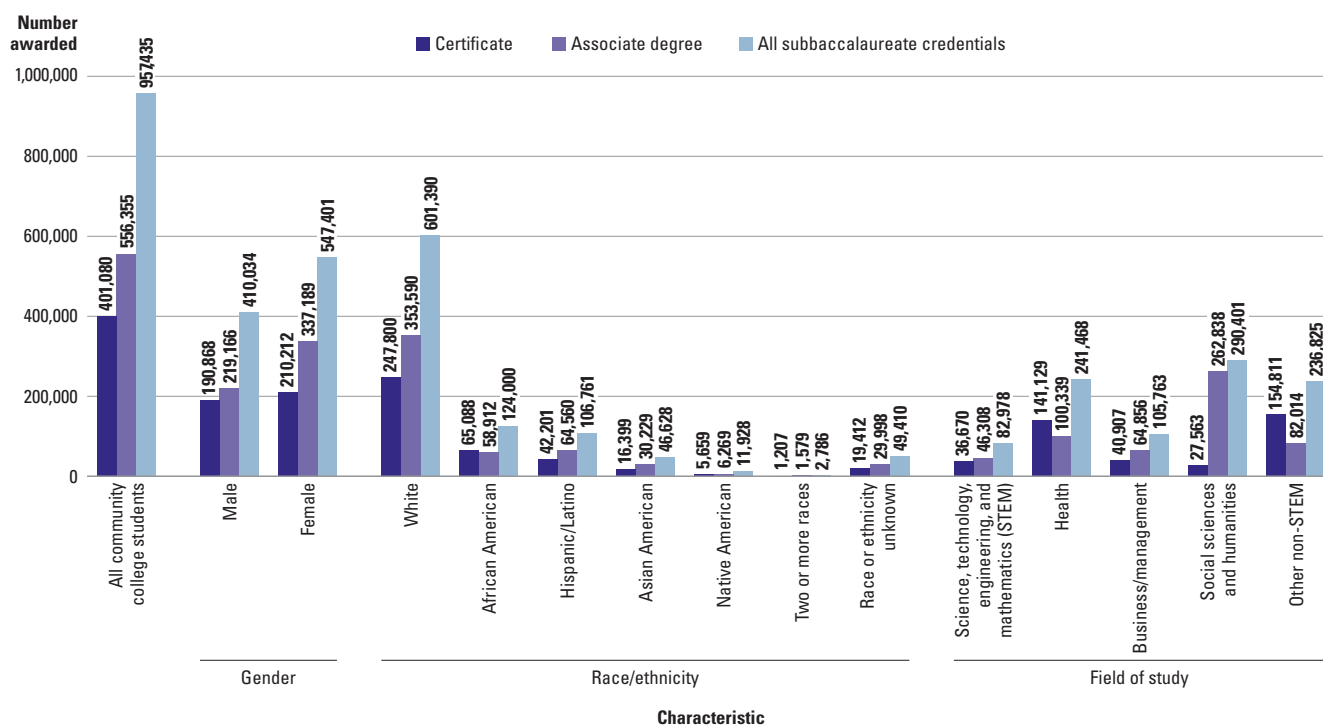
Tracking the number of associate degrees and certificates that community colleges confer each year shows how closely they are meeting the demand for college graduates. However, such estimates are not particularly informative on their own. For example, the number of associate degrees awarded to Hispanic students in a specified state

does not indicate whether that number is high, low or in proportion to the larger Hispanic population in that state. Such estimates are also not comparable across states without further context. Figure 18, an example of IPEDS data for the United States, shows a high level of detail but provides little context for interpreting such estimates.

On the other hand, this indicator does reveal, for example, that nationally, women earned more certificates and associate degrees than men. It also shows that health is a common field of study and that most associate degrees are awarded in the social sciences and humanities.

**FIGURE 18**

Number of Certificates and Associate Degrees Awarded in 2009-10 by U.S. Community Colleges



SOURCE: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS), Spring 2011.

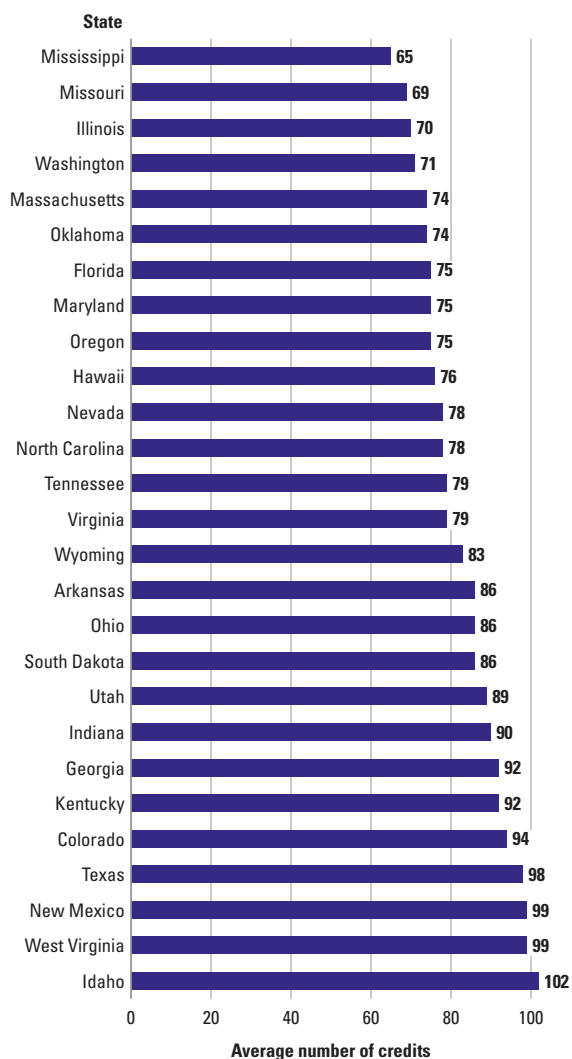
## Credits to Degree

Typically, 60 credits are required to earn an associate degree. That equates to about two years of full-time, college-level course work. Measuring the average number of credits earned toward an associate degree is important to understanding the level of effort students must maintain in community colleges. In the following example, using data reported by 27 states participating in Complete College America, students who completed an associate degree in the 2007-08 academic year earned anywhere from 65 to 102 credits on average, depending on the state (Figure 19). (Some associate degrees may have been earned at four-year colleges.) The median state value (for Tennessee and Virginia) was 79 credits. Credits earned in excess of 60 credits may represent additional learning, but also may mean that students and colleges are expending scarce resources on courses that do not necessarily count toward a certificate or a degree.

The number of credits required for a certificate varies across programs, from less than six semester credits to more than 60, and many certificates are measured in terms of clock or contact hours (Bosworth, 2010). The indicators (not shown here) of average credits earned while pursuing a certificate, reported by states to Complete College America, are limited to certificates of 30 credits or more, which is equivalent to at least one year of full-time enrollment.

**FIGURE 19**

**Average Number of Credits Earned Toward a Degree by Full-Time Students Who Earned Associate Degrees for 27 CCA States**



SOURCE: Complete College America (2011b), *Time is the enemy*, p. 33.

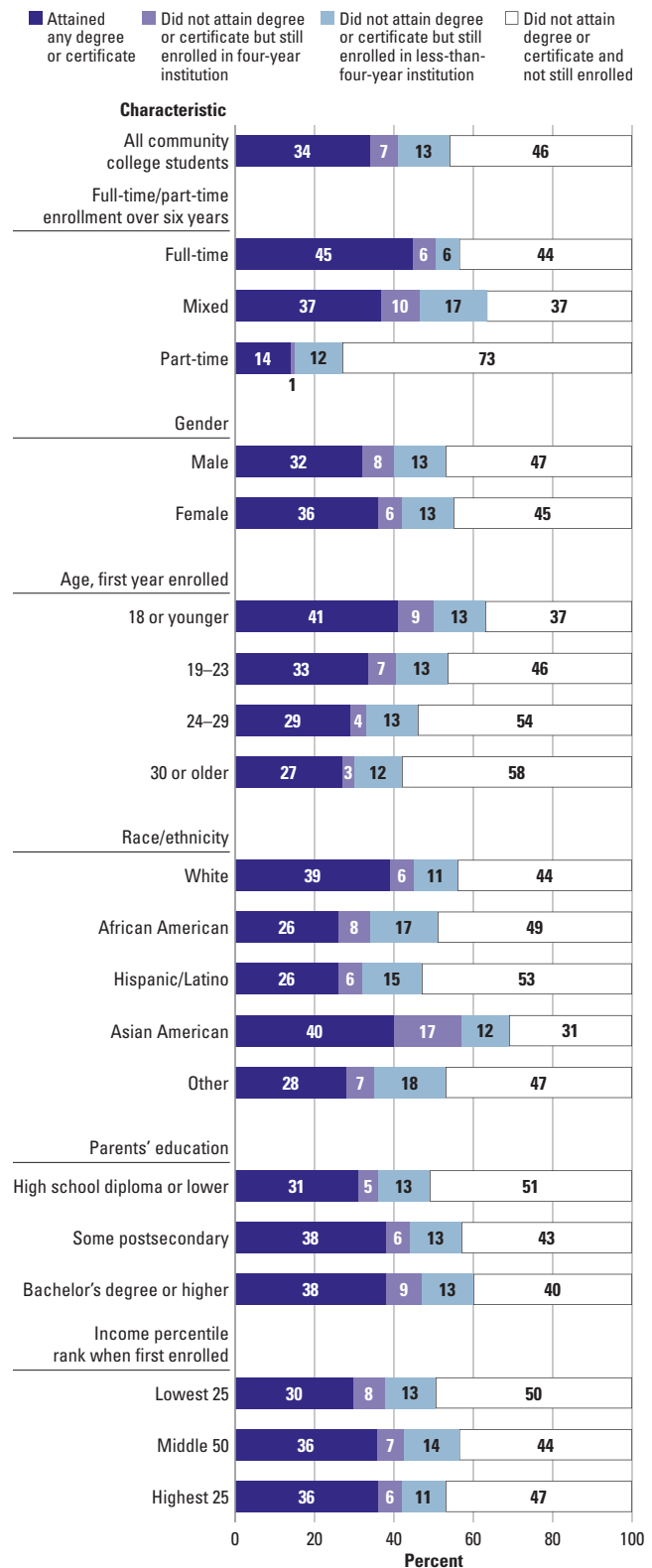
# Persistence Without a Degree After Six Years and Near Program Completion After Six Years

Since the normative time to degree (two years) for community college students is an established measure used by states, many states and institutions will restrict the data to this time period, excluding students who complete or persist beyond it. In addition, because community colleges have open enrollment, students have much more flexible attendance options. They may change their enrollment intensity from term to term, discontinue enrollment for a period of time or switch institutions. These factors prolong the period of time that community college students take to complete an associate degree or transfer to a four-year institution. Measuring six-year persistence provides an estimate of students who have not yet completed a degree or transfer curriculum but who may do so in the future.

For example, BPS:04/09, which follows a nationally representative sample of first-time college students for six years, tracks not only which community college students complete a certificate or degree, but also whether they are still enrolled and at what level of institution (four years or less than four years). In light of the fact that many community college students take longer than six years to complete a certificate or degree, this indicator shows the proportion of students who may earn a credential in the future (Figure 20).

FIGURE 20

Persistence Without a Degree After Six Years for U.S. Community College Students

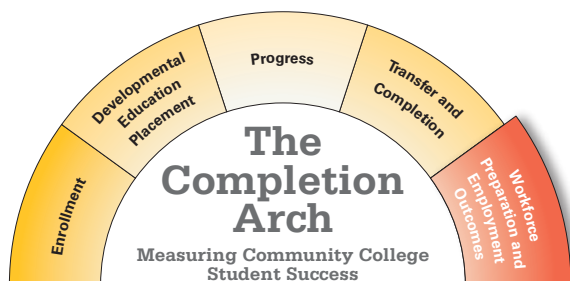


NOTE: Income percentile rank is calculated separately for dependent students, using parents' income, and independent students, using the students' own income. The percentile ranks for each group are then combined. Percentages may not sum to 100 because of rounding.  
SOURCE: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

## Future Updates

Forthcoming measures in this area will cover additional aspects of transfer and completion. One measure is simultaneous enrollment at multiple institutions, where students enroll at more than one institution without necessarily transferring. Additional expected measures are students who transfer to a four-year college without completing a transfer-level curriculum and indicators within the extant measures. For example, an indicator of near completion proposed by Voluntary Framework of Accountability would identify students who earned

at least 30 credits and maintained at least a 2.0 grade point average but did not complete a certificate or a degree or transfer. And as state longitudinal data systems develop, it is likely that more states will track community college students for up to six years and report their transfer and completion outcomes. These new and future indicators add context and meaning to longer-established indicators of transfer and graduation to better reflect the terminal educational outcomes of community college students.



## Workforce Preparation and Employment Outcomes

### MEASURES

- Licensure Exam Pass Rates
- Job Placement Rates
- Graduates' Wages and Wage Growth

Many students enroll in community colleges to acquire new skills so that they can improve their employment prospects. One goal of efforts to increase students' community college completion is to help them obtain well-paying or better-paying jobs in an increasingly knowledge-based labor market.

Postcollege workforce outcomes are measured in terms of professional licensure exam pass rates, job placement rates, and graduates' wages and wage growth. Although important, these data are not commonly or regularly reported, and the few indicators that are available are usually limited in scope and coverage and are not consistent across states.

## Licensure Exam Pass Rates

A map of the United States with five states highlighted in red: Wyoming, Texas, North Carolina, Ohio, and Massachusetts. These states represent the top five for the number of people with the surname 'Henderson'.

For detailed background data and additional information, please visit <http://completionarch.collegeboard.org>.



## What the Research Tells Us

**Many students** enroll in community colleges to acquire new skills so that they can improve their employment prospects. One goal of the effort to increase community college completion is to help students obtain well-paying or better-paying jobs in an increasingly knowledge-based labor market.

Measures of career and professional licensure exam pass rates, job placement rates, and graduates' wages and wage growth all contribute to an understanding of how well community college students are prepared for the workplace and how well they do in the workplace. Though important measures, these data are often limited in scope and are not commonly or regularly reported by many states and institutions. Measures may be limited to specific fields or subpopulations,

Community colleges award more than half of all certificates and associate degrees, so it is important to measure how well community colleges are preparing students for the workforce.

providing an incomplete picture of the outcomes of all community college students. There is also wide variation in how data are presented, which limits comparisons across states and institutions.

An estimated 20 to 30 percent of workers today are employed in fields where licenses are required (Kreuger, 2006), and many individuals attend a community college to satisfy their licensing requirements. Community colleges award more than half of all certificates and associate degrees, mostly in career-focused fields such as health care; business; and manufacturing,

construction, repair and transportation (Horn & Li, 2009, tables 3, 4). Thus, it is important to measure how well community colleges are preparing students for licensure. Several states report the results of licensing exams, but as described below, the results are not always reported in a way that makes them readily interpretable or actionable.

For a more in-depth review of the literature on Workforce Preparation and Employment Outcomes, see "What the Research Tells Us" on the Workforce Preparation and Employment Outcomes Web page.

## Licensure Exam Pass Rates

The first measure of workforce preparation and employment outcomes in *The Completion Arch* is licensure exam pass rates. Licensing standards vary by state and by occupation, but they typically require a certain level of specialized education and a passing score on a test of competence (Kreuger, 2006). Licensure exam pass rates reflect how well community colleges are preparing their students for specific occupations.

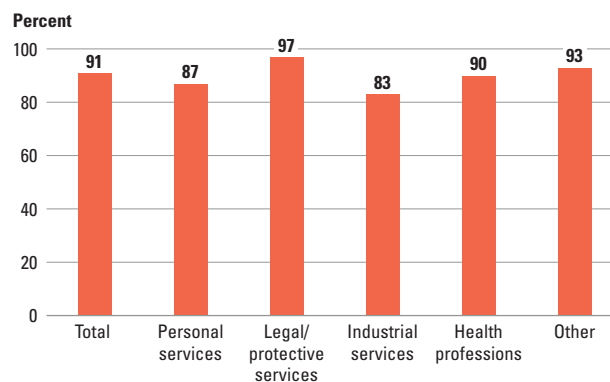
At present, relatively few states report licensure exam pass rates. When statistics are available, they are often limited to a specific field such as nursing and do not include other fields where certification and licensure are commonly required. Also, because states select their own standards and exams for licensure, it is difficult to make comparisons across states.

Texas is an example of a state that provides more detailed data on licensure exam pass rates. The state provides exam results for approved technical associate degree and certificate programs that lead to professions requiring licensure or certification (Figure 21). The data reveal that, overall, Texas community college students taking licensure and certification exams passed at a rate of 91 percent, and the rates were

higher in fields such as legal/protective services (97 percent) and lower in other fields related to industrial services (83 percent). Texas reports results for specific occupations, such as funeral direction, court reporting, sign language interpretation and translation, and optometric technician/assistant, but with relatively few test-takers per exam each year, the results are more meaningful when aggregated into summary categories. Perhaps for this reason, results are not disaggregated by gender, race/ethnicity, age or other student characteristics.

**FIGURE 21**

**Pass Rates for Texas Community and Technical College Students Who Took Licensure and Certification Exams in 2007-08, by Occupational Field**



SOURCE: Texas Higher Education Coordinating Board. (2010). *2007-2008 statewide annual licensure report*.

## Job Placement Rates

The second measure of student success in workforce preparation and employment outcomes is job placement rates. Again, relatively few states report employment statistics for community college students. Some states report job placement rates most often by matching student records to state unemployment insurance (UI) records that document monthly or quarterly earnings. Students with earnings in a given time period are counted as employed, and students with no earnings are counted as not employed. The chief limitation of this method is that individuals who are self-employed, employed by the federal government (including the military) or employed out of state do not pay into a state's UI system and therefore do not show up in the data. As a result, indicators based on UI data tend to underestimate the true employment rate. Some states attempt to fill these gaps by using other sources of administrative data, including UI data from neighboring states, federal government employment data and state tax records, but no state is currently able to fully measure the job placement rates of all its students in this fashion. Also, unlike more commonly reported state and national unemployment statistics, these UI-based job placement rates cannot exclude individuals categorized as "not looking for work" for reasons such as continuing their education or raising children.

Other states, such as Wisconsin and Wyoming, use surveys of former students to measure their employment outcomes. This method can capture the employment status of individuals who are not included in a state's UI records, so in this sense the survey data are more inclusive, and they can exclude individuals who report that they are not looking for work. On the other hand, while UI data cover the entire population, survey results reflect only those who respond to the survey, which may not be representative of all former students. And it is not known in general how accurate students' self-reports of employment are, so survey results may overestimate or underestimate student employment. The employment rates for the national sample of community college students in the 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09) are also based on survey responses, but because BPS:09 is a nationally representative survey, its results reflect employment outcomes of all students six years after they first enrolled in college.

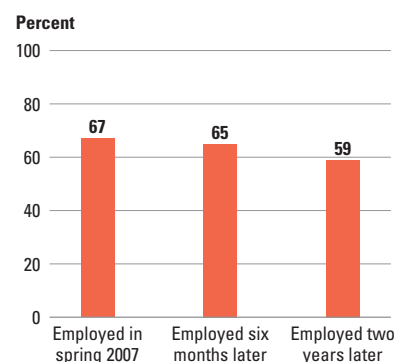
Regardless of how they are measured, job placement rates and other employment statistics such as wages are strongly influenced by local and regional economic conditions that are largely beyond the control of community colleges. Variation in demand for community college graduates may explain

differences in job placement rates across states and over time.

One of the more comprehensive indicators of job placement comes from Virginia (Figure 22). Job placement rates were estimated using UI records from Virginia and surrounding states for a more accurate measure of the employment of community college students. Data were also provided for several points in time, allowing one to look at employment trends. One weakness of this indicator is that these data do not distinguish between those who earned a certificate, those who earned an associate degree and those who left without earning any credential at all.

**FIGURE 22**

**Percentage of Spring 2007 Virginia Community College Exiters Employed in Spring 2007, Six Months Later and Two Years Later**

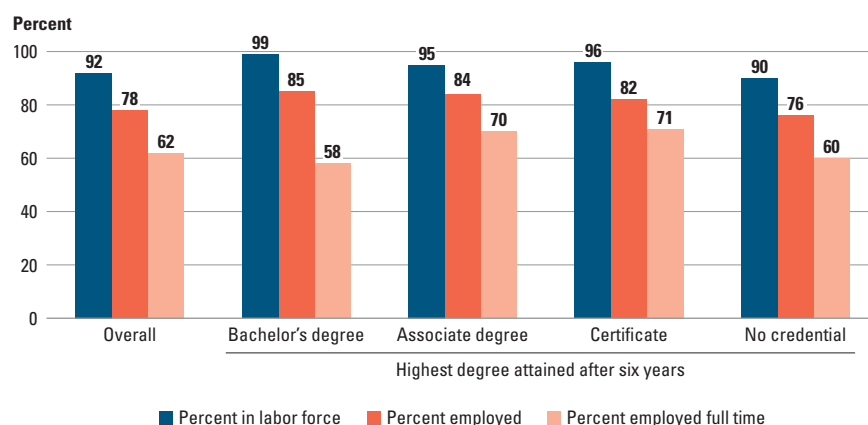


SOURCE: Virginia's Community Colleges. (2010, February). *Student success snapshot: An initial view of student success in the workforce*, Issue #12.

The results from BPS:04/09 show employment outcomes for a representative sample of U.S. community college students based on survey interviews rather than state UI data (Figure 23). Perhaps partly for this reason, the overall employment rate six years after starting college for students who left community colleges (78 percent) is higher than the rates reported by Virginia and most other states. This indicator also shows, among other things, that the overall percentage of community college students who were employed full time six years after starting college is somewhat lower (62 percent) than the overall employment rate and that individuals who completed a certificate or associate degree were more likely to be employed than students who did not complete any credential.

**FIGURE 23**

**Employment and Workforce Participation Rates for Students First Enrolled in U.S. Community Colleges in 2003-04**



SOURCE: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

## Graduates' Wages and Wage Growth

Beyond merely having a job, most community college students presumably want a job that pays well and allows them to earn more than they would have earned had they stopped their education after receiving a high school diploma. Wages after college and wage growth over time constitute the third measure of community college students' success in the workforce. Mean and median wages represent what a typical student might earn at a particular point in time after leaving a community college, and growth in wages after that shows the extent to which students continue to increase their earnings. In states such as Illinois, which report students' wages before and after attending a community college, the difference can be interpreted as a rough estimate of the effect of attending a community college on students' earnings. These statistics are the most meaningful when disaggregated by the type of award (certificate, associate degree, both or neither) and field of study.

Though some states report estimates of wages, there is no common standard for such reporting, so comparisons cannot be readily made. Most estimates of wages also come from UI records, so they have the same limitations as the employment statistics from UI described above. A few states report wage data longitudinally, while others limit estimates to one point in time. States also vary in how they estimate wages; for example, wages may be reported as hourly, quarterly or annual earnings.

Oklahoma reports average salaries one year and five years after students graduate from public institutions (including four-year colleges) (Figure 24). Although Oklahoma wage estimates were primarily drawn from UI records, they also include data from Oklahoma Tax Commission records, which cover many

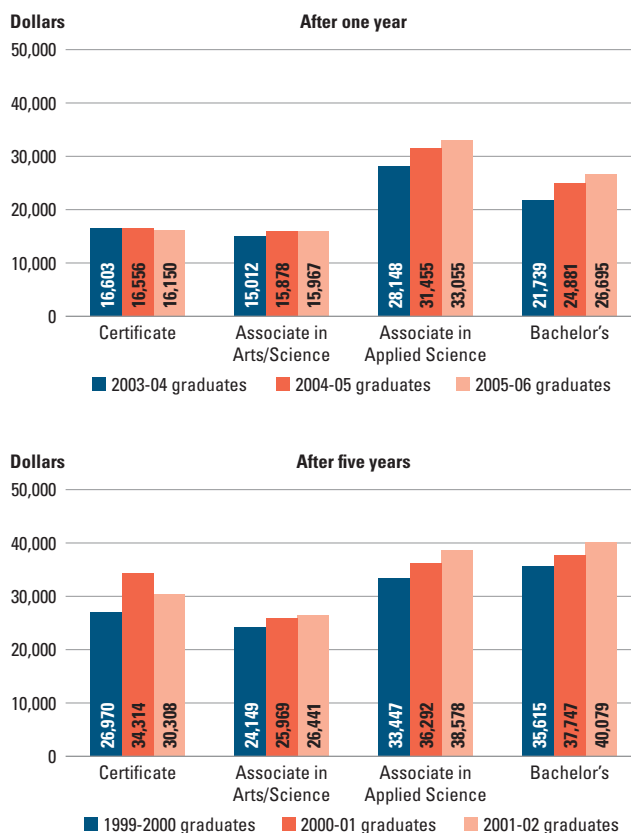
federal employees and self-employed individuals who are not included in UI data. Comparisons can also be made between the types of degrees awarded and earnings over time. For example, average earnings after one year for graduates with certificates or associate degrees in arts or sciences (A.A./A.S.) remained about the same over time, but they increased for graduates with associate degrees in applied sciences (A.A.S.) and bachelor's degrees (B.A./B.S.). In addition, graduates with A.A.S. degrees in applied fields earned more than those with B.A./B.S. degrees one year after college and earned only slightly less than those with B.A./B.S. degrees after five years. One limitation of this indicator as a measure of students' success in community colleges is that it may include some certificates and associate degrees

earned at four-year institutions, whereas most of the indicators in *The Completion Arch* are restricted to community college students.

The results from BPS:04/09 offer a nationally representative estimate of community college students' earnings three years and six years after starting college for those students who were no longer enrolled in any postsecondary institution (Figure 25). Importantly, these results are disaggregated by whether students completed a certificate or a degree, the highest type of credential they completed, and the field of study, age and other student demographics not shown here. Among other things, this indicator shows that students who transferred to a four-year institution and completed a bachelor's degree had the highest median salary,

FIGURE 24

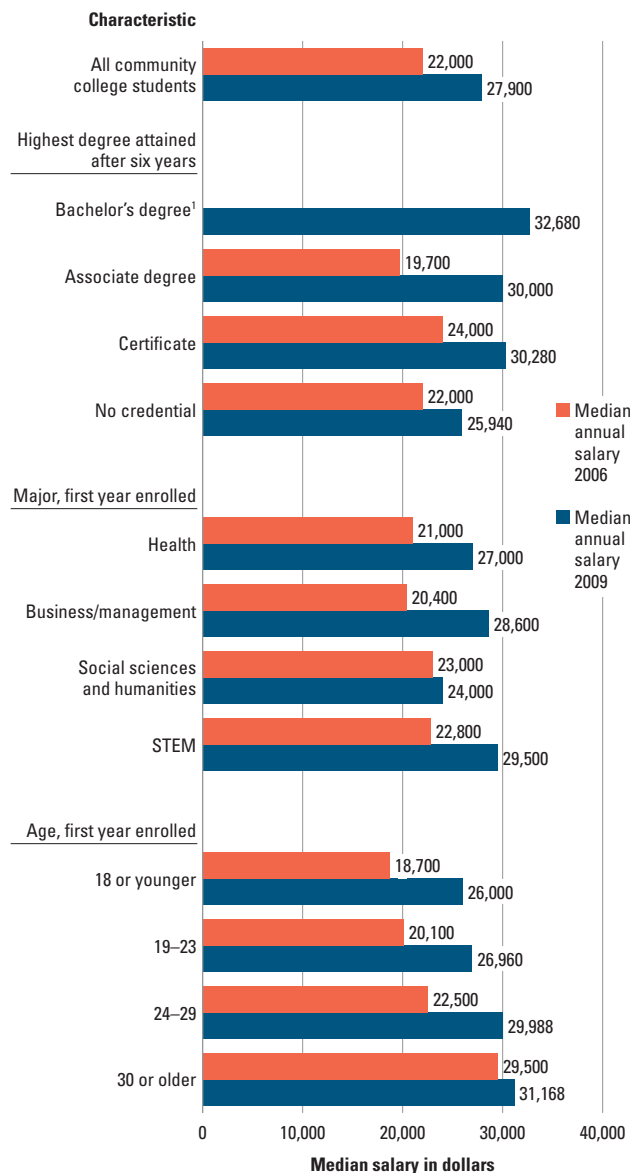
Average Salary for Oklahoma State System Graduates After One Year and Five Years, by Type of Award



SOURCE: Oklahoma State Regents for Higher Education. (n.d.). *Average annual salaries of state system graduates employed in Oklahoma one year and five years after graduation.*

FIGURE 25

Median Salary in 2006 and 2009 for Students Who First Enrolled in U.S. Community Colleges in 2003-04



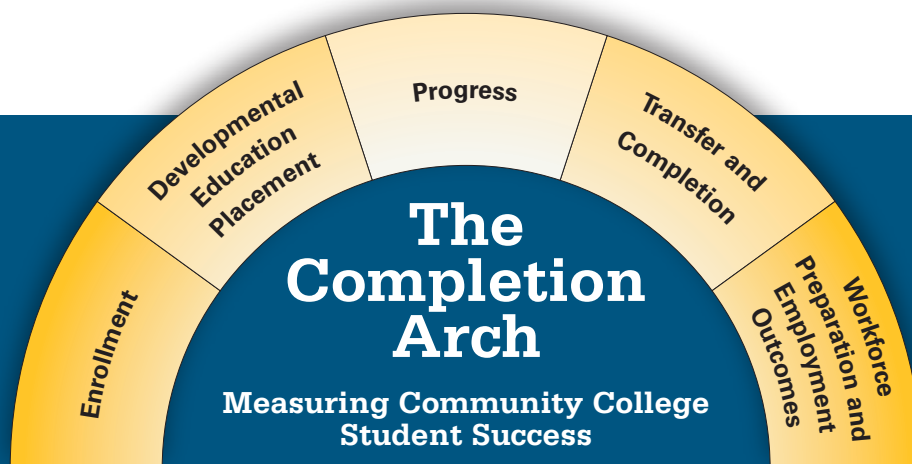
1. Median annual salary for 2006 is not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 2003-04 Beginning Postsecondary Students Longitudinal Study, Second Follow-up (BPS:04/09).

followed by students who earned certificates, students who earned associate degrees and students who did not earn a degree at all. Students who started in science, technology, engineering and math (STEM) fields earned the most, while students who started in the social sciences and humanities earned the least. Many indicators in *The Completion Arch* show less favorable outcomes for older students, but in this case, students who started community college at age 24 or older earned appreciably more on average than younger students, perhaps because the older students had accumulated more work experience before enrolling.

## Future Updates

One anticipated update to *The Completion Arch* is the addition of data from the two prior iterations of BPS:04/09, which measured the outcomes of students who started at community colleges in 1989-90 and 1995-96 using the same nationally representative sample of postsecondary students. Together, these three data sets can be used to show longer-term trends in employment outcomes than are currently available. This comparison over time would show, for example, whether the result that individuals with certificates earn higher salaries than individuals with associate degrees is a long-standing phenomenon or a more recent development.



## Conclusions and Next Steps

In this inaugural report for *The Completion Arch* project, we have endeavored to present as many national and state indicators available as of 2011, but we know the tally is not exhaustive. Moreover, national initiatives and other organizations continue to collect new data and define new indicators in response to the need for actionable data to track the effectiveness of policies and programs designed to improve student success. This is why *The Completion Arch* has been developed as a dynamic resource to be updated on a regular basis.

The next steps involve adding trend data to the IPEDS metrics and BPS national indicators. We also expect to add a set of indicators that address the “swirling” issue by reporting on the extent to which community college students attend multiple two-year institutions either simultaneously or sequentially. In addition, we will closely monitor the availability of data for indicators denoted as “future measures” for which data are not yet available, such as student learning outcomes.

As momentum builds toward meeting President Obama’s goal of producing five million more community college degrees and certificates by 2020, accurate and reliable data, common measures, and an understanding of exactly what the data mean are essential prerequisites to knowing whether or not we are making progress. We believe *The Completion Arch* plays a unique role in centralizing the data and information collected by many national and state initiatives that are working with great urgency toward the common goal of improving student success.



## References

- Adelman, C. (2005). *Moving into town and moving on: The community college in the lives of traditional-aged students*. Washington, DC: Office of Vocational and Adult Education, U.S. Department of Education. Retrieved June 25, 2010, from <http://www2.ed.gov/rschstat/research/pubs/comcollege/movingintotown.pdf>
- Adelman, C. (2009). *The spaces between numbers: Getting international data higher education straight*. Washington, DC: Institute for Higher Education Policy. Retrieved June 24, 2011, from <http://www.ihep.org/publications/publications-detail.cfm?id=131>
- Attewell, P. A., Lavin, D. E., Domina, T., & Levey, T. (2006). New evidence on college remediation. *Journal of Higher Education*, 77 (5), 886–924.
- Bailey, T. (2009, Spring). Challenge and opportunity: Rethinking the role and function of developmental education in community college. *New Directions for Community Colleges*, 145, 11–30.
- Bailey, T., Crosta, P. M., & Jenkins, D. (2006, August). *What can student right-to-know graduation rates tell us about community college performance?* CCRC Working Paper No. 6. New York: Columbia University, Teachers College, Community College Research Center. Retrieved June 22, 2011, from <http://ccrc.tc.columbia.edu/Publication.asp?uid=498>
- Bailey, T., Jenkins, D., & Leinbach, T. (2005). *Is student success labeled institutional failure? Student goals and graduation rates in the accountability debate at community colleges*. CCRC Working Paper No. 1. New York: Columbia University, Teachers College, Community College Research Center. Retrieved June 26, 2011, from <http://ccrc.tc.columbia.edu/Publication.asp?uid=342>
- Bailey, T., Jeong, D. W., & Cho, S.-W. (2010). Referral, enrollment, and completion in developmental education sequences in community colleges. *Economics of Education Review*, 29 (2), 255–270.
- Baime, D. (2011, September 14). Obama's best bet: \$5-billion for community colleges. *Chronicle of Higher Education*.
- Baum, S., Ma, J., & Payea, K. (2010). *Education pays 2010*. New York: The College Board. Retrieved June 26, 2011, from [http://trends.collegeboard.org/downloads/Education\\_Pays\\_2010.pdf](http://trends.collegeboard.org/downloads/Education_Pays_2010.pdf)
- Bearer-Friend, J. (2009, November 9). *Measuring student achievement at postsecondary institutions*. Issue Brief. Washington, DC: National Governors Association Center for Best Practices. Retrieved June 24, 2011, from <http://www.nga.org/files/live/sites/NGA/files/pdf/0911MEASURINGACHIEVEMENT.PDF>
- Belfield, C. R., & Bailey, T. (2011). The benefits of attending community college: A review of the evidence. *Community College Review*, 39 (1), 46–68.
- Bettinger, E. P., & Long, B. T. (2009, June 20). Addressing the needs of underprepared students in higher education. *Journal of Human Resources*, 44 (3), 736–771.
- Bosworth, B. (2010, December). *Certificates count: An analysis of sub-baccalaureate certificates*. Washington, DC: Complete College America. Retrieved June 26, 2011, from <http://dl.dropbox.com/u/13281059/Other%20Certificates%20Count%20Release%20Docs/Certificates%20Count%20FINAL%2012-05.pdf>
- Brint, S. (2002). Data on higher education in the United States: Are the existing resources adequate? *American Behavioral Scientist*, 45 (10), 1493–1522.
- Cabrera, A. F., Burkum, K. R., & La Nasa, S. M. (2005). Pathways to a four-year degree: Determinants of transfer and degree completion. In A. Seidman (Ed.), *College student retention: Formula for student success* (pp. 155–209). Westport, CT: Praeger Publishers.
- Calcagno, J. C., Crosta, P., Bailey, T., & Jenkins, D. (2006, October). *Stepping stones to a degree: The impact of enrollment pathways and milestones on community college student outcomes*. CCRC Working Paper No. 4. New York: Columbia University, Teachers College, Community College Research Center. Retrieved September 27, 2011, from <http://ccrc.tc.columbia.edu/Publication.asp?uid=452>



## References — continued

- Chen, X. (2005). *First-generation students in postsecondary education: A look at their college transcripts* (NCES 2005-171). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved September 27, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005171>
- Clery, S. (2010, March/April). *Attendance and completion patterns*. Data Notes: Keeping Informed About Achieving the Dream Data. Silver Spring, MD: Achieving the Dream. Retrieved September 27, 2011, from <http://www.achievingthedream.org/Portal/Modules/cd45e39e-a40c-497c-9543-1035f18c212a.asset?>
- Clery, S., & Topper, A. (2008, July/August). *Developmental education: Completion status and outcomes*. Data Notes: Keeping Informed About Achieving the Dream Data. Silver Spring, MD: Achieving the Dream. Retrieved February 16, 2012, from <http://eric.ed.gov/PDFS/ED521310.pdf>
- Collins, M. L. (2008, July). *It's not about the cut score: Redesigning placement assessment policy to improve student success*. Achieving the Dream: Community Colleges Count. Policy Brief. Boston: Jobs for the Future.
- Cominole, M., Riccobono, J., Siegel, P., & Caves, L. (2010). *2007–08 National Postsecondary Student Aid Study (NPSAS:08) full-scale methodology report* (NCES 2011-188). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved June 30, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011188>
- Complete College America. (2011a, March). *Common college completion metrics technical guide*. Washington, DC: Author. Retrieved February 12, 2012, from [http://www.completecollege.org/docs/Metrics%20Technical%20Guide%20Final\\_3\\_24\\_2011.pdf](http://www.completecollege.org/docs/Metrics%20Technical%20Guide%20Final_3_24_2011.pdf)
- Complete College America. (2011b, September). *Time is the enemy*. Washington, DC: Author. Retrieved November 1, 2011, from [http://www.completecollege.org/docs/Time\\_Is\\_the\\_Enemy.pdf](http://www.completecollege.org/docs/Time_Is_the_Enemy.pdf)
- Dougherty, K. J., & Reid, M. (2007, April). *Fifty states of Achieving the Dream: State policies to enhance access to and success in community colleges across the United States*. New York: Columbia University, Teachers College, Community College Research Center. Retrieved June 17, 2011, from <http://ccrc.tc.columbia.edu/Publication.asp?UID=504>
- Evelyn, J. (2003, April 11). Making waves in Miami: A leading community college offers bachelor's degrees, reflecting national tension between 2- and 4-year sectors. *Chronicle of Higher Education*, p. 31.
- Ewell, P. (2006, January 10–12). *Reaching consensus on common indicators: A feasibility analysis*. Paper presented at the Using State Data to Improve Community College Student Success and Attainment: State Student Data Project for Bridges and AtD, San Antonio, Texas. Retrieved September 27, 2011, from <http://www.nchems.org/pubs/docs/JFFCommonIndicators.pdf>
- Executive Office of the Mayor, District of Columbia. (2011, November 9). *Appointees named to University of the District of Columbia Community College Transition Independence Advisory Board*. Press release. Retrieved February 17, 2012, from <http://dc.gov/DC/Mayor/About+the+Mayor/News+Room/Appointees+Named+to+University+of+the+District+of+Columbia+Community+College+Transition+Independence+Advisory+Board>
- Garcia, T. I., & L'Orange, H. P. (2010, July). *Strong foundations: The state of state postsecondary data systems*. Boulder, CO: State Higher Education Executive Officers. Retrieved June 28, 2011, from <http://www.shhee.org/sspds/>
- Gonzalez, J. (2011, June 12). Go to community college, earn a bachelor's degree: Florida likes that combination. *Chronicle of Higher Education*, p. A1.
- The Higher Education Act of 1965, P.L. 89-329, 79 Stat. 1219 (1965).

## References — continued

- Horn, L. (2009). *On track to complete? A taxonomy of beginning community college students and their outcomes 3 years after enrolling: 2003–04 through 2006* (NCES 2009-152). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved December 19, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2009152>
- Horn, L., & Lew, S. (2007). *California community college transfer rates: Who is counted makes a difference*. MPR Research Brief #1. Berkeley, CA: MPR Associates, Inc. Retrieved November 1, 2010, from [http://mprinc.com/products/pdf/horn\\_ccc.pdf](http://mprinc.com/products/pdf/horn_ccc.pdf)
- Horn, L., & Li, X. (2009). *Changes in postsecondary awards below the bachelor's degree: 1997 to 2007* (NCES 2010-167). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved March 1, 2012, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2010167>
- Horn, L., & Nevill, S. (2006). *Profile of undergraduates in U.S. postsecondary education institutions, 2003–04: With a special analysis of community college students* (NCES 2006-184). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved June 26, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2006184>
- Hughes, K. L., & Scott-Clayton, J. (2011, February). *Assessing developmental assessment in community colleges*. CCRC Working Paper No. 19. New York: Columbia University, Teachers College, Community College Research Center. Retrieved November 30, 2011, from <http://ccrc.tc.columbia.edu/Publication.asp?UID=856>
- Hussar, W. J., & Bailey, T. M. (2011). *Projections of education statistics to 2020* (NCES 2011-026). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved November 25, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011026>
- Jackson, K. W., Peecksen, S., Jang, D., & Sukasih, A. (2005). *Integrated Postsecondary Education Data System data quality study* (NCES 2005-175). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved September 29, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005175>
- Jobs for the Future. (2008). *Test drive: Six states pilot better ways to measure and compare community college performance*. Achieving the Dream: Community Colleges Count. Policy Brief. Boston: Author. Retrieved October 29, 2010, from <http://www.jff.org/sites/default/files/testdriveforWeb.pdf>
- Knapp, L. G., Kelly-Reid, J. E., & Ginder, S. A. (2009). *Enrollment in postsecondary institutions, fall 2007; graduation rates, 2001 & 2004 cohorts; and financial statistics, fiscal year 2007* (NCES 2009-155). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved November 25, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2009155>
- Knapp, L. G., Kelly-Reid, J. E., & Ginder, S. A. (2011a). *Enrollment in postsecondary institutions, fall 2009; graduation rates, 2003 & 2006 cohorts; and financial statistics, fiscal year 2009* (NCES 2011-230). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved November 25, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011230>
- Knapp, L. G., Kelly-Reid, J. E., & Ginder, S. A. (2011b). *Postsecondary institutions and price of attendance in the United States: 2010–11, degrees and other awards conferred: 2009–10, and 12-month enrollment: 2009–10* (NCES 2011-250). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved November 25, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011250>
- Kreuger, A. B. (2006, March 2). Do you need a license to earn a living? You might be surprised at the answer. *The New York Times*.

## References — continued

- Lacey, T. A., & Wright, B. (2009). *Occupational employment projections to 2018*. Washington, DC: Bureau of Labor Statistics, U.S. Department of Labor. Retrieved June 1, 2011, from <http://www.bls.gov/opub/mlr/2009/11/art5full.pdf>
- Leinbach, D. T., & Jenkins, D. (2008, January). *Using longitudinal data to increase community college student success: A guide to measuring milestone and momentum point attainment*. CCRC Research Tools No. 2. New York: Columbia University, Teachers College, Community College Research Center. Retrieved November 1, 2010, from <http://www.eric.ed.gov/PDFS/ED499922.pdf>
- Moore, C., & Shulock, N. (2009, September). *Student progress toward degree completion: Lessons from the research literature*. Sacramento: California State University, Sacramento, Institute for Higher Education Leadership & Policy. Retrieved November 1, 2010, from [http://www.csus.edu/ihelp/PDFs/R\\_Student\\_Progress\\_Toward\\_Degree\\_Completion.pdf](http://www.csus.edu/ihelp/PDFs/R_Student_Progress_Toward_Degree_Completion.pdf)
- Moore, C., & Shulock, N. (2011, August). *Sense of direction: The importance of helping community college students select and enter a program of study*. Sacramento: California State University, Sacramento, Institute for Higher Education Leadership & Policy. Retrieved September 14, 2011, from [http://www.csus.edu/ihelp/PDFs/R\\_Sense\\_of\\_Direction.pdf](http://www.csus.edu/ihelp/PDFs/R_Sense_of_Direction.pdf)
- Moore, C., Shulock, N., & Jensen, C. (2009). *Crafting a student-centered transfer process in California: Lessons from other states*. Sacramento: California State University, Sacramento, Institute for Higher Education Leadership & Policy. Retrieved June 26, 2011, from [http://www.hewlett.org/uploads/documents/Crafting\\_a\\_Student-Centered\\_Transfer\\_Process\\_in\\_California.pdf](http://www.hewlett.org/uploads/documents/Crafting_a_Student-Centered_Transfer_Process_in_California.pdf)
- Moore, C., Shulock, N., & Offenstein, J. (2009, October). *Steps to success: Analyzing milestone achievement to improve community college student outcomes*. Sacramento: California State University, Sacramento, Institute for Higher Education Leadership & Policy. Retrieved November 1, 2010, from [http://www.csus.edu/ihelp/PDFs/R\\_Steps%20to%20success\\_10\\_09.pdf](http://www.csus.edu/ihelp/PDFs/R_Steps%20to%20success_10_09.pdf)
- National Center for Education Statistics. (n.d.-a). *2004/09 Beginning Postsecondary Students Longitudinal Study (BPS:04/09) Postsecondary Education Transcript Study (PETS:09)*. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved December 15, 2011, from <http://nces.ed.gov/datalab/>
- National Center for Education Statistics. (n.d.-b). *Integrated Postsecondary Education Data System: Fall enrollment*. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved July 18, 2011, from <http://nces.ed.gov/ipeds/glossary/index.asp?id=802>
- National Center for Education Statistics. (n.d.-c). *Integrated Postsecondary Education Data System: Sector*. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved June 28, 2011, from <http://nces.ed.gov/ipeds/glossary/index.asp?id=587>
- National Center for Education Statistics. (n.d.-d). *Integrated Postsecondary Education Data System: Unduplicated count*. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved July 18, 2011, from <http://nces.ed.gov/ipeds/glossary/index.asp?id=679>
- National Center for Education Statistics. (n.d.-e). *IPEDS compendium tables: Table 21. Awards conferred by Title IV institutions, by race/ethnicity, level of award, and gender: United States, academic year 2008-09*. Washington, DC: U.S. Department of Education, Institute of Education Sciences. Retrieved December 7, 2011, from [http://nces.ed.gov/das/library/tables\\_listings/showTable2005.asp?popup=true&tableID=7105&rt=p](http://nces.ed.gov/das/library/tables_listings/showTable2005.asp?popup=true&tableID=7105&rt=p)
- National Governors Association. (2010, July 11). *New NGA chair unveils college completion initiative*. News Release. Washington, DC: Author. Retrieved December 22, 2011, from [http://www.nga.org/cms/home/news-room/news-releases/page\\_2010/col2-content/main-content-list/title\\_new-nga-chair-unveils-college-completion-initiative.html](http://www.nga.org/cms/home/news-room/news-releases/page_2010/col2-content/main-content-list/title_new-nga-chair-unveils-college-completion-initiative.html)

## References — continued

- Nelson, L. A. (2011, November 30). Measuring completion. *Inside Higher Ed*.
- North Carolina Community College System Office of the President. (2009, September 11). *Data trends and briefings*. Raleigh, NC: Author.
- Offenstein, J., Moore, C., & Shulock, N. (2010, April). *Advancing by degrees: A framework for increasing college completion*. Sacramento, CA, and Washington, DC: Institute for Higher Education Leadership & Policy and The Education Trust. Retrieved June 24, 2011, from [http://www.csus.edu/ihelp/PDFs/R\\_AdvbyDegrees\\_0510.pdf](http://www.csus.edu/ihelp/PDFs/R_AdvbyDegrees_0510.pdf)
- Offenstein, J., & Shulock, N. (2009, August). *Community college student outcomes: Limitations of the Integrated Postsecondary Education Data System (IPEDS) and recommendations for improvement*. Sacramento: Institute for Higher Education Leadership & Policy, California State University, Sacramento. Retrieved June 24, 2011, from [http://www.csus.edu/ihelp/PDFs/R\\_IPEDS\\_08-09.pdf](http://www.csus.edu/ihelp/PDFs/R_IPEDS_08-09.pdf)
- Offenstein, J., & Shulock, N. (2010, September). *Taking the next step: The promise of intermediate measures for meeting postsecondary completion goals*. Boston: Jobs for the Future. Retrieved November 1, 2010, from [http://www.jff.org/sites/default/files/ATD\\_TakingtheNextStep\\_092810.pdf](http://www.jff.org/sites/default/files/ATD_TakingtheNextStep_092810.pdf)
- Oklahoma State Regents for Higher Education. (n.d.). *Average annual salaries of state system graduates employed in Oklahoma one year and five years after graduation*. Oklahoma City: Author. Retrieved August 22, 2011, from <http://www.okhighered.org/oeis/outcomes/EmploymentSalaries/AverageAnnualSalaries.html>
- Perin, D. (2006). Can community colleges protect both access and standards? The problem of remediation. *Teachers College Record*, 108 (3), 339–373.
- Perry, M., Bahr, P. R., Rosin, M., & Woodward, K. M. (2010). *Course-taking patterns, policies, and practices in developmental education in the California community colleges*. Mountain View, CA: EdSource. Retrieved October 26, 2010, from <http://www.edsource.org/assets/files/ccstudy/FULL-CC-DevelopmentalCoursetaking.pdf>
- Peter, K., & Cataldi, E. F. (2005). *The road less traveled? Students who enroll in multiple institutions* (NCES 2005-157). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved June 24, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005157>
- Provasnik, S., & Planty, M. (2008). *Community colleges: Special supplement to The Condition of Education 2008* (NCES 2008-033). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved June 26, 2011, from <http://nces.ed.gov/pubs2008/2008033.pdf>
- Roksa, J., & Calcagno, J. C. (2008, June). *Making the transition to four-year institutions: Academic preparation and transfer*. CCRC Working Paper No. 13. New York: Columbia University, Teachers College, Community College Research Center. Retrieved September 27, 2011, from <http://ccrc.tc.columbia.edu/Publication.asp?UID=618>
- Roksa, J., Jenkins, D., Jaggars, S. S., Zeidenberg, M., & Cho, S.-W. (2009, November). *Strategies for promoting gatekeeper course success among students needing remediation: Research report for the Virginia community college system*. New York: Columbia University, Teachers College, Community College Research Center. Retrieved November 30, 2011, from <http://ccrc.tc.columbia.edu/Publication.asp?UID=735>
- Shulock, N., & Moore, C. (2007). *Rules of the game: How state policy creates barriers to degree completion and impedes student success in the California community colleges*. Sacramento: Institute for Higher Education Leadership & Policy. Retrieved November 1, 2010, from [http://www.csus.edu/ihelp/PDFs/R\\_Rules\\_of\\_the\\_Game\\_02-07.pdf](http://www.csus.edu/ihelp/PDFs/R_Rules_of_the_Game_02-07.pdf)
- Skomsvold, P., Radford, A. W., & Berkner, L. (2011). *Six-year attainment, persistence, transfer, retention, and withdrawal rates of students who began postsecondary education in 2003–04* (NCES 2011-152). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved September 27, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011152>

## References — continued

- Snyder, T. D., & Dillow, S. A. (2011). *Digest of education statistics, 2010* (NCES 2011-015). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved June 10, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011015>
- Staklis, S. (2010). *Web tables: Profile of undergraduate students: 2007–08* (NCES 2010-205). Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education. Retrieved December 1, 2011, from <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2010205>
- Texas Higher Education Coordinating Board. (2010). *2007–2008 statewide annual licensure report*. Austin, TX: Author. Retrieved September 27, 2011, from <http://www.txhighereddata.org/reports/performance/ctlcbb/licensure.cfm>
- Topper, A., & Lee, J. (2010, September/October). *Outcomes of first-year persisting students*. Data Notes: Keeping Informed about Achieving the Dream Data. Silver Spring, MD: Achieving the Dream. Retrieved September 27, 2011, from [http://www.achievingthedream.org/sites/default/files/news/DataNotes\\_SeptOct\\_2010.pdf](http://www.achievingthedream.org/sites/default/files/news/DataNotes_SeptOct_2010.pdf)
- Virginia's Community Colleges. (2010, February). *Student success snapshot: An initial view of student success in the workforce*. Richmond, VA: Office of Institutional Research and Effectiveness. Retrieved September 27, 2011, from [http://www.vccs.edu/Portals/0/ContentAreas/AcademicServices/StudentSuccess/StudentSuccessSnapshot\\_12-02182010.pdf](http://www.vccs.edu/Portals/0/ContentAreas/AcademicServices/StudentSuccess/StudentSuccessSnapshot_12-02182010.pdf)
- Voluntary Framework of Accountability (VFA). (2011, November). *Voluntary Framework of Accountability metrics manual version 1.0*. American Association of Community Colleges. Retrieved March 19, 2012, from <http://www.aacc.nche.edu/Resources/aaccprograms/VFAWeb/Documents/VFA%20Metrics%20Manual%20v.1.0.pdf>



## Appendix A. Primary Data Sources

The indicators that appear in *The Completion Arch* originate from the primary data sources described below. In addition to these sources, there are indicators from published academic research studies. These secondary sources are summarized in “What the Research Tells Us” for each area on *The Completion Arch* website (<http://completionarch.collegeboard.org>).

### National Indicators

The **Beginning Postsecondary Students (BPS) Longitudinal Study** is conducted by the National Center for Education Statistics (NCES) in the U.S. Department of Education. BPS follows a cohort of students who are enrolling in postsecondary education for the first time. The most recent cohort includes more than 18,000 students who enrolled in college for the first time during the 2003-04 year. BPS:04/09 interviewed students in 2004, 2006 and 2009, and unlike most data sources featured in *The Completion Arch*, it follows students after they transfer or stop out and reenroll. The BPS indicators in *The Completion Arch* are derived from PowerStats, an NCES statistical application that is available to the public. *The Completion Arch* also refers to publications based on BPS in order to explain the significance and national context of certain indicators.

**Available at:**

<http://nces.ed.gov/surveys/bps/>

<http://nces.ed.gov/datalab/>

The **BPS:04/09 Postsecondary Education Transcript Study (PETS:09)** is an important component of the BPS study. PETS:09 collected transcripts from all postsecondary institutions attended by BPS:04/09 participants. It provides information on types of courses, course grades, course-taking patterns, enrollment patterns and credit accumulation. Researchers can derive many of the momentum points and

milestone metrics for a national community college cohort that has been followed for six years. Transcript data can address questions concerning student progress and attainment, continuity in fields of study, and transfer/mobility across institution types.

**Available at:**

<http://nces.ed.gov/surveys/pets/>

### Integrated Postsecondary Education Data System (IPEDS)

is a group of interrelated surveys conducted annually by NCES. IPEDS gathers information from every college, university, and technical and vocational institution that participates in federal student financial aid programs (i.e., Title IV institutions). The Higher Education Act of 1965, as amended, requires that institutions participating in federal student aid programs report data on enrollments, program completions, graduation rates, faculty and staff, finances, institutional prices, and student financial aid. IPEDS is a key source of standardized national data that are comparable over time. IPEDS data are also comparable at the state level, as described below.

**Available at:**

<http://nces.ed.gov/ipeds/>

### State Indicators

**Complete College America (CCA)** is a national nonprofit organization that aims to increase the number of Americans with postsecondary credentials and close attainment gaps for traditionally underrepresented populations. It seeks to achieve this goal by effectively using data to promote policy change and build consensus among state leaders, higher education officials and the national education policy community. The organization was established as an extension of Complete to Compete, a National Governors Association (NGA) initiative (National Governors Association, 2010). In



2010, NGA adopted a set of metrics (Complete College America, 2011a) to consistently measure student progress and success across states based on the report from the working group on common college completion metrics, and in 2011, CCA released its first report using these data. Currently, *The Completion Arch* uses CCA indicators for up to 27 states, and this number will increase as additional states provide data. These indicators are disaggregated by students' age, race/ethnicity, income, type of credential, initial enrollment status and remedial status.

**Available at:**

<http://www.completecollege.org/>

**IPEDS** data on community college students are also available at the state level and are comparable across all 50 states. Most of the IPEDS state indicators in *The Completion Arch* are available from the IPEDS State Data Center. See IPEDS detail above under "National Indicators."

**Available at:**

<http://nces.ed.gov/ipeds/sdc/>

**State Longitudinal Data Systems** are primarily designed for administrative and accountability purposes. However, they can provide insight into the progress, attainment and outcomes of community college students. As of 2010, a total of 44 states and the District of Columbia had a system that included higher education data (Garcia & L'Orange, 2010, table 1). The amount of information and detail these systems contain and the extent to which this information is communicated to the public varies widely across states. When statistics about community colleges are available, they are usually published and disseminated through state departments of education and higher education, community college systems, state university systems, and workforce agencies. In some cases, states make these data available to academic researchers for analysis and publication.

## Community College Consortia

**Achieving the Dream (ATD): Community Colleges Count**

is an initiative to improve outcomes for community college students while closing the attainment gap. As of 2011, ATD collected longitudinal records for more than 2 million first-time credential-seeking students at 160 participating colleges in 30 states and the District of Columbia. These students are being tracked in participating colleges for at least six years and possibly more. Many of the indicators in *The Completion Arch*, particularly in the area of Developmental Education Placement and the area of Progress, are based on published sources that feature ATD data.

**Available at:**

<http://www.achievingthedream.org/>

## Major Academic Research Organizations

Researchers affiliated with these two organizations produced much of the scholarly and applied research featured in *The Completion Arch*.

The **Community College Research Center (CCRC)** at Columbia University's Teachers College conducts applied and scholarly research on various aspects of community colleges, including student success. Many of the indicators in *The Completion Arch* are drawn from CCRC studies of student records from ATD, the Virginia Community College System, and the Washington State Board of Community and Technical Colleges.

**Available at:**

<http://ccrc.tc.columbia.edu/>



The **Institute for Higher Education Leadership & Policy (IHELP)** at California State University, Sacramento conducts research on higher education policy in California. A number of *The Completion Arch* indicators are taken from IHELP's research using student records from the California Community Colleges Chancellor's Office.

**Available at:**

<http://www.csus.edu/ihelp/>

## Primary Definition Sources

These sources, described above, also are key sources of definitions of community college student success.

**Complete College America**

**Achieving the Dream: Community Colleges Count**

**The Community College Research Center**

The following sources are currently developing metrics of community college student success but did not have data available in 2011.

The **Voluntary Framework of Accountability (VFA)**, launched in 2009, is an effort to develop and report standardized measures of performance that are meaningful and useful for community colleges. A preliminary list of metrics was released in 2011 for pilot testing in selected sites, and a national rollout is planned for 2012. When the results are publicly available, VFA will serve as a primary source of indicators for *The Completion Arch*.

**Available at:**

<http://www.aacc.nche.edu/vfa/>

The federal **Committee on Measures of Student Success** is a panel of higher education and policy experts appointed by the U.S. secretary of education under the authority of the Higher Education Opportunity Act of 2008. Its charge is to recommend improvements to the current IPEDS graduation rate and alternative measures of progress and achievement that are more appropriate for students at community colleges and other two-year institutions. The committee released its final recommendations in 2011.

**Available at:**

<http://www2.ed.gov/about/bdscomm/list/acmss.html>



# Appendix B. Availability of Indicators by State

					Enroll- ment	Dev. Ed. Placement	Progress						Transfer and Completion				Workforce Prep.					
	Fall enrollment	Unduplicated annual enrollment	Participation in developmental courses	Completion of the first developmental course	Enrollment in developmental courses	Completion of gatekeeper courses	Threshold number of credits in specified time	Persistence over terms and years	Completion of transfer curriculum	Specified credits earned in first term	Continuous enrollment	Summer credits earned	Graduation rates	Number of degrees and certificates awarded	Completion rates within six years	Persistence without a degree after six years	Time to degree	Credits to degree	Near program completion after six years	Licensure exam pass rates	Job placement rates	Graduates' wages and wage growth
United States	•	•	•		•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
ATD*	•	•	•	•	•	•		•	•	•					•							
Alabama	•	•		•					•					•	•							
Alaska	•	•							•					•	•							
Arizona	•	•	•	•	•				•					•	•							
Arkansas	•	•							•					•	•		•	•				
California	•	•	•	•		•	•	•	•	•	•	•	•	•	•							
Colorado	•	•	•	•	•				•					•	•							
Connecticut	•	•							•					•	•	•	•			•	•	
Delaware	•	•							•					•	•					•	•	
Florida	•	•	•	•	•				•					•	•	•	•			•	•	
Georgia	•	•	•	•	•				•					•	•					•	•	
Hawaii	•	•	•	•	•				•					•	•					•	•	
Idaho	•	•	•	•	•				•					•	•					•	•	
Illinois	•	•	•	•	•				•					•	•					•	•	
Indiana	•	•	•	•	•				•					•	•					•	•	
Iowa	•	•							•					•	•					•	•	
Kansas	•	•							•					•	•					•	•	
Kentucky	•	•	•	•	•				•					•	•					•	•	
Louisiana	•	•	•	•	•				•					•	•					•	•	
Maine	•	•							•					•	•					•	•	
Maryland	•	•	•						•					•	•					•	•	
Massachusetts	•	•	•	•	•				•					•	•				•	•		
Michigan	•	•							•					•	•					•	•	
Minnesota	•	•							•					•	•					•	•	
Mississippi	•	•	•	•	•				•					•	•					•	•	
Missouri	•	•	•	•	•				•					•	•					•	•	
Montana	•	•							•					•	•					•	•	
Nebraska	•	•							•					•	•					•	•	
Nevada	•	•	•	•	•				•					•	•					•	•	
New Hampshire	•	•							•					•	•					•	•	
New Jersey	•	•							•					•	•					•	•	
New Mexico	•	•	•	•					•					•	•					•	•	
New York	•	•							•					•	•					•	•	
North Carolina	•	•	•	•	•	•			•	•	•	•	•	•	•				•	•		
North Dakota	•	•							•					•	•					•	•	
Ohio	•	•	•	•	•				•					•	•	•	•			•	•	
Oklahoma	•	•	•	•	•				•					•	•					•	•	
Oregon	•	•	•	•	•				•					•	•					•	•	
Pennsylvania	•	•							•					•	•					•	•	
Rhode Island	•	•							•					•	•					•	•	
South Carolina	•	•							•					•	•					•	•	
South Dakota	•	•							•					•	•					•	•	
Tennessee	•	•	•	•	•				•					•	•					•	•	
Texas	•	•	•	•	•				•					•	•	•	•			•	•	
Utah	•	•	•	•	•				•					•	•					•	•	
Vermont	•	•							•					•	•					•	•	
Virginia	•	•	•	•	•				•	•	•			•	•					•	•	
Washington	•	•	•	•	•	•			•	•	•			•	•					•	•	
West Virginia	•	•	•	•	•				•					•	•					•	•	
Wisconsin	•	•							•					•	•					•	•	
Wyoming	•	•	•	•	•				•					•	•					•	•	

\* Achieving the Dream.



# Appendix C. Glossary

## Enrollment

Enrollment indicators summarize the number and percentage of students enrolled each year in community colleges.

### Fall enrollment

**Measure Description:** Fall enrollment is the number of students enrolled on a day designated by the institution in the fall term or on October 15.

**Measure/Indicators Definitions:** Fall enrollment includes students enrolled in courses creditable toward a degree or other formal award, students enrolled in courses in a vocational or occupational program, and high school students taking regular college courses for credit. The indicator shows the most recent data available for each state and nationwide in terms of the percentage of undergraduates enrolled in community colleges, their demographic characteristics, and the increasingly smaller shares of students identified as first time, full time and degree-seeking. Future updates of *The Completion Arch* will include enrollment trends over time.

**Indicator Definition Source:**

Integrated Postsecondary Education Data System (IPEDS)

### Unduplicated annual enrollment

**Measure Description:** Unduplicated annual enrollment is the count of students enrolled over a 12-month period; each student is counted only once. Unlike in most four-year colleges, many community college students do not enroll in the fall but do enroll in winter, spring or summer. Therefore, annual enrollment is a more accurate measure of the size of the community college student population than fall enrollment.

**Measure/Indicators Definitions:** Like fall enrollment, students included in the unduplicated annual enrollment count are those enrolled in courses creditable toward a degree or other formal award; those enrolled in vocational or occupational programs; and high school students taking regular college courses for credit. In addition to the demographic characteristics of students, the indicator shows the percentage of students who are Pell Grant recipients, which is a measure of the size of the low-income population. Future updates of *The Completion Arch* will include enrollment trends over time.

**Indicator Definition Source:** IPEDS, Complete College America (CCA)

## Developmental Education Placement

A majority of community college students take at least one developmental education course during their enrollment. Most colleges require students to take placement tests to determine if they need developmental education and, if so, at what precollege-course level.

### Placement in developmental courses

**Measure Description:** Placement is the college's official assessment of the student's academic readiness in a given subject. In theory, it should be an accurate measure of need for developmental education; however, in practice, many students disregard the referral and enroll in a different level of developmental course in that subject, in a college-level course in that subject, or in no course at all in that subject.

#### Measure/Indicators Definitions:

Placement indicators depict the level of developmental education courses students need based on their placement referral: one level below the college level, two levels below the college level and so forth. Depending on the data source, placement statistics are shown by subject (math, reading, writing and English) and combinations of subjects, and whenever available, data are broken out by student characteristics.

**Indicator Definition Source:** Achieving the Dream (ATD), Voluntary Framework of Accountability (VFA), Community College Research Center (CCRC), Published Sources

### Participation in developmental courses

**Measure Description:** Participation in developmental courses is simply a report of enrollment in developmental courses regardless of placement. Participation data are more widely available in state data systems and tend to be more consistently reported.

#### Measure/Indicators Definitions:

Participation indicators are often reported as the percentage of a defined cohort of students who enroll in a developmental course, by subject or by combinations of subjects. Like placement indicators, statistics are broken out by student characteristics when data are available.

**Indicator Definition Source:** ATD, Beginning Postsecondary Students Longitudinal Study (BPS) Postsecondary Education Transcript Study (PETS:09), CCA, VFA, CCRC, Published Sources

## Progress

Intermediate measures of student progress are important for understanding and encouraging student goals and outcomes.

### PRECOLLEGE MILESTONES

Most beginning community college students need to take at least one developmental education course before they can begin earning college credits toward obtaining a credential or transferring. Progress toward completing these precollege requirements is a milestone for community college students.

#### Completion of the first developmental course

**Measure Description:** For many students, passing the first developmental course in a subject is their first community college milestone.

**Measure/Indicators Definitions:** This measure shows the percentage of community college students who complete their first development course. States and institutions may report these data in different ways, for example, by level of developmental course and by subject. The most common developmental courses reported are math and English (with reading and writing sometimes reported separately).

**Indicator Definition Source:** VFA, CCRC, Published Sources

#### Completion of developmental sequence

**Measure Description:** Completing the developmental course sequence in a subject by passing the highest-level developmental course is a major milestone and the final precollege milestone.

**Measure/Indicators Definitions:** This measure shows the percentage of community college students who complete the developmental course sequence in a given subject. The two most common courses reported are writing and math.

**Indicator Definition Source:** ATD, CCRC, CCA, VFA, Published Sources

### COLLEGE MILESTONES

There are several common major milestones that students must meet before attaining a credential or transferring to a four-year college. Progress toward completing these milestones is an important measure of student success.

#### Enrollment in gatekeeper courses

**Measure Description:** A gatekeeper course is the first or the lowest-level college course students take in a subject such as English or math. Most certificate, degree and transfer programs require students to pass gatekeeper courses in one or more subjects, yet the largest obstacle to passing gatekeeper courses seems to be that students do not enroll in them.

**Measure/Indicators Definitions:** This measure shows the enrollment of community college students in gatekeeper courses in two commonly required subjects, English and math. The reporting of enrollment in gatekeeper courses varies across states, though national initiatives may provide data that are comparable across states.

**Indicator Definition Source:** ATD, Published Sources

## Progress — continued

### Completion of gatekeeper courses

**Measure Description:** Completion of gatekeeper courses, the lowest-level college courses in the core subjects of English and math, is strongly associated with attainment of certificates and degrees and transfer to a four-year institution. Completion of gatekeeper courses fulfills requirements for graduation and transfer as well as pre-requisites for more advanced courses in various fields.

**Measure/Indicators Definitions:** This measure shows community college student completion of gatekeeper courses in two commonly required subjects, English and math. The reporting of the rates at which students complete gatekeeper courses varies across states, though national initiatives may provide data that are comparable across states.

**Indicator Definition Source:** ATD, PETS:09, Published Sources

### Threshold number of credits in specified time

**Measure Description:** Students who intend to complete a program and obtain a credential or transfer to a four-year college must complete a required number of course credits. Earning a specific number of credits is a milestone that is associated with future success and, for students who are not interested in completing a formal credential, earning a certain number of college-level credits may constitute a goal in and of itself.

**Measure/Indicators Definitions:** This measure shows community college students' accumulation of credits within a specified period of time. The specific indicators of credit accumulation reported here depend on the source and can range from 12 to 42 credits earned within two to six years. Nationally representative estimates are available from PETS:09.

**Indicator Definition Source:** PETS:09, CCA, VFA, Published Sources

### Persistence over terms and years

**Measure Description:** Most associate degree and transfer programs require the equivalent of two years of full-time enrollment, and a longer period for part-time enrollment, so persistence beyond the first year is essential for many students to achieve their goals.

**Measure/Indicators Definitions:** The one-year persistence rate reported by IPEDS only counts students who remain enrolled at the community college where they first started, while the BPS:04/09 tracks persistence for students who transfer between institutions.

**Indicator Definition Source:** BPS, CCA, IPEDS, VFA



# Progress — continued

## Completion of transfer curriculum

**Measure Description:** Completion of the transfer or general education curriculum is a milestone for transfer-bound students who may or may not attain an associate degree before they transfer. Community college students who complete a transfer curriculum usually do so to receive upper-division or junior-level standing when they transfer to a four-year institution, but students who transfer without completing a transfer curriculum may spend additional time and money completing their general education courses at the four-year institution.

**Measure/Indicators Definitions:** This measure shows the percentage of students who completed a transfer curriculum at their community college. Data are limited, and the transfer curriculum is likely to vary widely across institutions and states.

**Indicator Definition Source:** Published Sources

## MOMENTUM

*Momentum points* are specific enrollment and course-taking patterns. Though not necessarily achievements in and of themselves, they tend to predict future success.

## Full-time attendance in first term

**Measure Description:** Community college students who enroll full time during their first term are more likely to persist and complete their program or transfer. Full-time students attempt more credits than part-time students, so they are better able to earn more credits in a shorter amount of time.

**Measure/Indicators Definitions:** This measure shows the percentage of students enrolled or attending full time in their first term of community college. Full time is generally defined as enrolled in 12 or more credits. Estimates from IPEDS include national and state data, while other indicators include a subset of institutions and states.

**Indicator Definition Source:** ATD, IPEDS

## Completion of courses attempted

**Measure Description:** Students who complete all the courses they attempt avoid having to repeat course work, accumulate credits faster, and take less time to attain a credential or transfer than students who fail to complete some courses.

**Measure/Indicators Definitions:** Indicators provide completion rates for courses attempted by community college students in a number of states. States vary in how they report course completion rates, and data are not likely to be comparable across states.

**Indicator Definition Source:** PETS:09, CCA, Published Sources

## Progress — continued

### Specified credits earned within one year

**Measure Description:** Researchers generally agree that students need to earn a certain number of credits during their first year to gain momentum toward completion and transfer.

**Measure/Indicators Definitions:** The indicators in this measure specify a particular threshold number of credits in the first year. Across states, the reported threshold number of credits earned will vary between 18 and 30 credits, but the time frame will always be within one year.

**Indicator Definition Source:** PETS:09, CCA, VFA, Published Sources

### Continuous enrollment

**Measure Description:** Community college students who enroll continuously are more likely to transfer to a four-year college and to earn an associate degree. Continuous enrollment typically requires students to be enrolled in every term except the summer and brief winter terms.

**Measure/Indicators Definitions:** Indicators in this measure show the percentage of community college students who were continuously enrolled. Data on continuous enrollment are limited, and the time frame examined may vary across indicators.

**Indicator Definition Source:** ATD, PETS:09, CCA, Published Sources

### Summer credits earned

**Measure Description:** Taking classes in the summer expedites students' progress to degree attainment or transfer. Summer enrollment contributes to faster credit accumulation and reflects students' commitment to academic achievement.

**Measure/Indicators Definitions:** This measure shows the percentage of community college students who completed summer credits. Few states and institutions report these data.

**Indicator Definition Source:** PETS:09, Published Sources

## Transfer and Completion

Most beginning community college students intend to earn a certificate or degree. Thus, understanding their academic progress is critical to increasing the rates at which students complete community college.

### Graduation rates

**Measure Description:** The institutional graduation rate that is derived from IPEDS is the most well-known and widely reported indicator of community college completion. Over time, the graduation rates reported in IPEDS have become key components of college rankings and state accountability systems for public colleges.

**Measure/Indicators Definitions:** The IPEDS institutional graduation rates are reported annually according to a standard formula and can be compared over time and across states and individual institutions. However, these estimates are limited to first-time, full-time students who begin in the fall, thus excluding the large share of community college students who initially enroll part time or in other terms.

**Indicator Definition Source:** IPEDS, CCA

### Number of degrees and certificates awarded

**Measure Description:** As the largest single sector of postsecondary education, community colleges are a major focus of efforts to graduate more students with certificates and degrees. Measuring the number of associate degrees and certificates that community colleges confer each year helps track their success in meeting the demand for college graduates.

**Measure/Indicators Definitions:** Using data from IPEDS, the number of certificates and associate degrees awarded by community colleges are reported nationally and in each state.

**Indicator Definition Source:** ATD, CCA, IPEDS

### Completion rates within six years

**Measure Description:** Although the normative graduation time for community colleges is defined as two years of enrollment, most community college students take longer than three or even four years to complete an associate degree because they attend part time or need to complete developmental education courses. In addition, many students attend community colleges to take lower-division courses for a bachelor's degree, and some transfer to a four-year institution without obtaining a credential. From the perspective of community colleges, four-year transfer students have finished a curriculum that prepared them for a bachelor's degree program and therefore are considered as having completed community college.

**Measure/Indicators Definitions:** This measure includes six-year completion rates for community college students.⇒

## Transfer and Completion — continued

However, because measurement of completion at six years does not fall within the reporting structure of graduation at normative time, or even 200 percent of normative time, estimates are limited, and states report data using different methods. Some states track and report which community college students graduate from other institutions, including four-year institutions, but other sources may report only students who complete credentials below the bachelor's degree within six years. Using data from BPS:04/09, attainment of the highest degree completed anywhere within six years is reported, as is four-year transfer.

**Indicator Definition Source:** BPS, CCA, VFA, Published Sources

### **Persistence without a degree after six years**

**Measure Description:** Traditionally, students must study full time for two years in a community college to earn an associate degree or complete a lower-division curriculum for transfer to a four-year college. However, less than half of community college students enroll full time in their first term, and even fewer enroll full time for two consecutive years. Because many part-time students enroll less than half time, and most must take at least one developmental education course that does not count toward a degree or transfer, six years may not be long enough for community college students to meet their educational goals.

**Measure/Indicators Definitions:** This measure represents the proportion of community college students who were unable to complete or transfer within six years but may still do so. There are few sources for estimates of community college student persistence after six years, and the data that do exist are not likely to be comparable across states. Using data from BPS:04/09, persistence anywhere after six years is reported, and this figure is broken out by the institution level (four years or less than four years) in which students are still enrolled. If students are still enrolled at a four-year institution, they have a good chance of obtaining a bachelor's degree.

**Indicator Definition Source:** BPS, VFA, Published Sources

# Transfer and Completion — continued

## Time to degree

**Measure Description:** The length of time it takes a student to complete a credential is particularly relevant to community colleges because the longer a student is enrolled, the more it costs both the student and the college in terms of direct and opportunity resources. The student may continue paying tuition and fees and forgoing employment, while the college continues to spend on instruction and other services while possibly turning away other students.

**Measure/Indicators Definitions:** This measure includes national- and state-level estimates of time to degree for community college students. However, this measure includes only students who actually earn a credential, and the result depends on how long the students are followed. For example, if students are tracked for five years, students who take six years or longer to complete a degree are not counted, though doing so would inevitably increase the average time to earn a degree.

**Indicator Definition Source:** PETS:09, CCA, Published Sources

## Credits to degree

**Measure Description:** Associate degrees earned at community colleges typically require 60 credits of course work, while the credit requirements for certificates vary widely. Student credit accrual is a measure of their progress toward completing a certificate or degree. Earning credits in excess of the program requirements may represent additional effort and learning above and beyond the bare minimum, but it also means that students and colleges are expending scarce resources on courses that do not count toward a certificate or degree.

**Measure/Indicators Definitions:** This measure includes national and state estimates of the number of credits that community college students have accrued toward completion of certificates and degrees.

**Indicator Definition Source:** CCA, Published Sources

## Near program completion after six years

**Measure Description:** This measure represents those community college students who left before completing a certificate or degree or transferring to a four-year college but nonetheless made significant academic progress while enrolled. Some students who make progress toward completing a credential may have achieved their educational goals (such as acquiring specific job skills), while others would be well on their way toward completion or transfer if they decide to return to community college.

**Measure/Indicators Definitions:** This measure shows the percentages of late stop-out students (those who earned at least 30 credits within two years) who eventually reenrolled in community college or transferred to another college.

**Indicator Definition Source:** ATD, VFA

## Workforce Preparation and Employment Outcomes

Many students enroll in community colleges to acquire new skills so that they can improve their employment prospects. One goal of efforts to increase students' community college completion is to help them obtain well-paying or better-paying jobs in an increasingly knowledge-based labor market.

### Licensure exam pass rates

**Measure Description:** An estimated 20 to 30 percent of the workforce is employed in occupations that require licensing, including many health care occupations such as nursing. Licensing standards vary by state and occupation, but they typically require a certain level of specialized education and a passing score on a test of competence. Licensure exam pass rates show how well community colleges are preparing students to enter these fields.

**Measure/Indicators Definitions:** This measure shows the percentage of students passing a licensure exam in a specific occupation such as nursing, a general field such as health care, or across a number of fields. At present, few states report licensure exam pass rates, often for a limited number of fields, and because states select their own standards and exams, it is difficult to make comparisons across states.

**Indicator Definition Source:** VFA, Published Sources

### Job placement rates

**Measure Description:** Students seeking a certificate or degree from a community college often do so to improve their employment prospects. Job placement rates following completion of courses or programs are a key measure of program quality and student success.

**Measure/Indicators Definitions:** Most sources estimate job placement by matching student records to state unemployment insurance (UI) records. Individuals with earnings in a given time period are counted as employed, and those with no earnings are counted as not employed. Other sources, including BPS:04/09, use surveys to measure which individuals are employed and which ones are looking for work.

**Indicator Definition Source:** BPS, U.S. Department of Education Committee on Measures of Student Success, VFA, Published Sources

### Graduates' wages and wage growth

**Measure Description:** Students who enroll in community colleges to obtain a job also want one that pays well and enables them to earn more than they would have otherwise. Mean and median wages represent what a typical student might earn at a particular point in time after leaving a community college, and growth in wages shows to what degree students continue to increase their earnings or the difference between their precollege and postcollege earnings.

**Measure/Indicators Definitions:** Most sources estimate wages and wage growth by matching student records to state unemployment insurance (UI) records for a specific amount of time after students leave a community college. Some sources measure wages at multiple points in time, in some instances including before enrollment in a community college, to show growth in wages. Other sources are based on surveys of students who have left a community college. These indicators are most meaningful when disaggregated by the student's type of award (certificate, associate degree, both or neither) and field of study.

**Indicator Definition Source:** BPS, VFA, Published Sources

This report provides the most recent and complete state and national statistics available on community colleges in the United States.

*The Completion Arch: Measuring Community College Student Success* was authored by Laura Horn and David Radwin of MPR Associates, Inc., with invaluable assistance from Stephen J. Handel, Phoebe Ho, Morgan Matthews, Harish Menon, Paul Skomsvold and Ronald Williams.

### **Contact Information for the Authors**

Laura Horn, lhorn@mprinc.com  
David Radwin, dradwin@mprinc.com

*The Completion Arch: Measuring Community College Student Success* supplements a website that makes detailed data available for reference and downloading. The PDF version of this report is available on the Web:  
<http://completionarch.collegeboard.org>.

Hard copies may be ordered by contacting  
cbadvocacy@collegeboard.org.

Tables, graphs and data in this report or excerpts thereof may be reproduced or cited, for noncommercial purposes only, provided that the following attribution is included:

Source: *The Completion Arch: Measuring Community College Student Success*.

© 2012 The College Board.

[www.collegeboard.org](http://www.collegeboard.org)

## **Acknowledgments**

This publication would not have been possible without the cooperation and support of many people at the College Board, including Tara Goldman, Stephen J. Handel, Jessica Howell, Harish Menon, Christen Pollock, Leanne Snoeck, and Ronald Williams.

At MPR Associates, we are very grateful to Vera Bersudskaya, Alicia Broadway, Natesh Daniel, Kurt Dusek, Donna Fowler, Barbara Kridl, Terry Lew, Andrea Livingston, and John Vavricka for their expert assistance with research, editing, graphic design, programming, and database development.

**Visit *The Completion Arch* on the Web at:  
<http://completionarch.collegeboard.org>**